

# OPERATION - INSTALLATION - SERVICE MANUAL



**Ductable hydronic terminal  
units with electronic and  
electromechanical control.**

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**HWD - HWDE  
602÷1104**



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The following symbols are used in this publication and inside the unit:



**User**



**Important**



**Danger voltage**



**Installer**



**Prohibition**



**Danger moving blades**




**Assistance**



**Climaveneta** is part of the Eurovent certification programme.


The manufacturer reserves the right to modify the data in this manual without warning.

 **HWD-HWDE terminal units** are the internal units of a ductable hydronic system. When used in combination with water chillers, they form a cooling only system, when used with reversible water chillers/heat pumps, they form a cooling and heating system.

Incorrect installation, regulation and maintenance, improper use or installation by unqualified personnel absolves the manufacturer from all liability, whether contractual or otherwise, for damage to people, animals or things. Only those applications specifically indicated in this list are allowed.

**Read this manual carefully.** All work must be carried out by qualified personnel in conformity with legislation in force in the country concerned.

**The guarantee is invalidated** if the above instructions are not respected and if the unit is started up for the first time without the presence of personnel authorised by the Company (where specified in the supply contract) who should draw up a "start-up report".


 **The documentation supplied with the unit** must be consigned to the owner who should keep it carefully for future consultation.

**When the items are consigned by the carrier,** check that the packaging and the unit are undamaged. If damage, missing components or consignment errors are noted, indicate this on the delivery note. A formal complaint should be sent via fax or registered post to the After Sales Service within eight days from the date of receipt of the items.

All the operations involved in handling, installing, starting up and testing the unit must be carried out by qualified personnel. Failure to observe this warning could cause serious damage.

## FUNDAMENTAL SAFETY RULES

When using this unit, which requires electricity and water, a number of fundamental safety rules must be observed, namely:

 **The unit must not be used** by children or by unfit persons without suitable supervision.

**Do not touch the unit** with bare feet or with wet or damp parts of the body.

**Do not carry out cleaning operations** without first disconnecting the unit from the electricity supply by placing the mains switch in the "off" position.


**Do not modify safety or regulation devices** without authorisation and instructions from the manufacturer.

**Do not pull,** detach or twist the electrical cables coming out of the unit, even when disconnected from the mains electricity supply.

**Do not open doors** or panels providing access to the internal parts of the unit.

**Do not dispose of, abandon** or leave within reach of children packaging materials (cardboard, staples, plastic bags, etc) as they may represent a hazard.

**Respect safety distances** between the unit and other equipment or structures. Guarantee suitable space for access to the unit for maintenance and/or service operations.

 **The unit must be installed** in a closed technical room. The fan outlets must be protected with ducts or grills preventing access to the impellers.

**Power supply:** the cross section of the electrical cables must be adequate for the power of the unit and the power supply voltage must correspond with the value indicated on the respective units. All units must be earthed in conformity with current legislation in the country concerned.

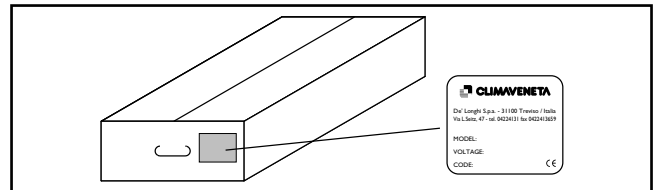
**Hydraulic connections** should be carried out as indicated in the instructions to guarantee correct operation of the unit.

**Handle the unit with the utmost care** (see table on page 3) and avoid damaging it.

**HWD-HWDE** hydronic terminals can be identified by the:

### Packaging label

Giving the data identifying the product.

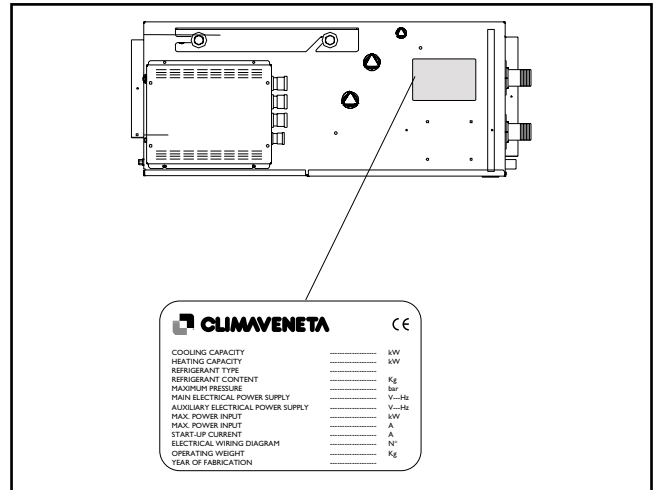


### Rating plate

Giving the technical and performance data of the unit.

If this is lost, ask the After Sales Service for a replacement.

**⚠** Tampering with or the removal or absence of rating plates or other means enabling the unit to be identified causes problems during installation and maintenance.



## RECEIVING AND HANDLING THE PRODUCT

**HWD-HWDE** hydronic terminals are supplied accompanied by a plastic envelope fixed to the top of the hydronic terminal containing:

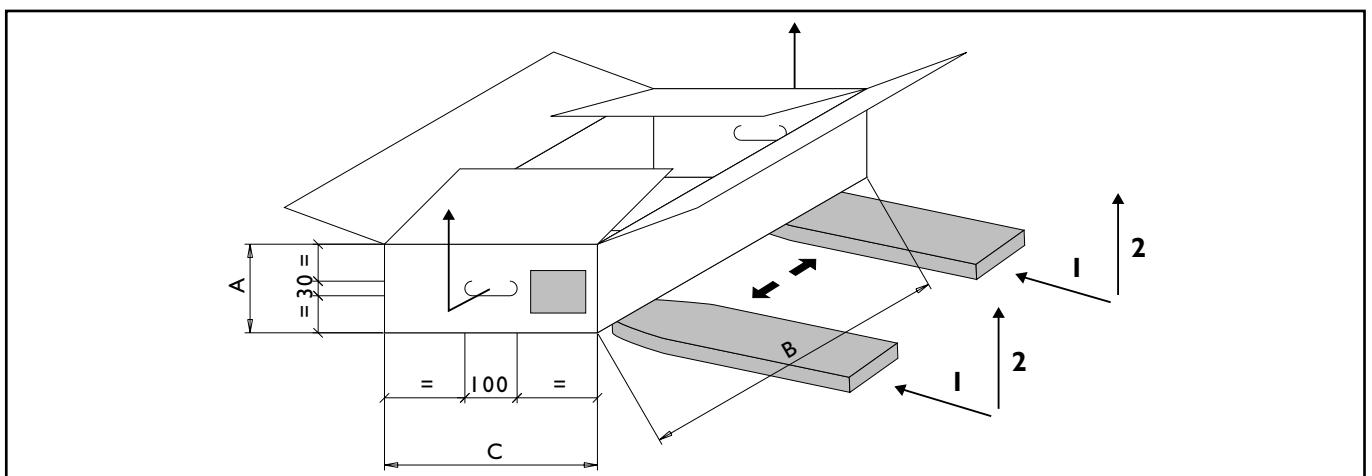
- instruction manual;
- guarantee certificate;
- CE declaration.

The unit should always be handled by qualified personnel using equipment adequate for the weight of the hydronic terminal.

**⚠** The instruction manual is an integral part of the unit and should thus be read and kept carefully.

**⊘** Do not dispose of packaging materials in the environment or leave them within reach of children as they may represent a hazard or a source of pollution.

**⚠** During transport, the hydronic terminals should be handled with extreme care.



Size	602	703	803	904	1003	1104
Model	HWD - HWDE	HWD - HWDE	HWD - HWDE	HWD - HWDE	HWD - HWDE	HWD - HWDE
Dimension A (mm)	335	335	335	335	355	355
Dimension B (mm)	1055	1055	1205	1205	1405	1405
Dimension C (mm)	815	815	815	815	875	875
Gross weight (kg)	45	47	54	56	58	70

**HWD-HWDE** units are designed for flush mounting. In combination with the numerous accessories available, they can be used to create high specification installations for air distribution and environmental temperature and humidity control.

### STRUCTURE

Structure in hot-galvanised steel panelling, complete with couplings for connection to ducting and gravity drain condensate pan. Internal self-extinguishing closed cell expanded polyethylene thermal and acoustic insulation. Removable regenerable filter in self-extinguishing acrylic, efficiency class EU2. Ceiling mounting brackets and threaded bars, complete with vibration dampers, fixing washers and bolts and threaded tie-bars for ceiling fixing. Insulating gasket for connection to ducting.

### HEAT EXCHANGE COIL

With copper tubes and high exchange surface area aluminium fins.

### FAN

Centrifugal fan, electronic speed regulation, statically and dynamically balanced impellers. High working head.

### ELECTRICAL SWITCHBOARD

Power and control electrical switchboard constructed in accordance with IEC 204-1/EN60204-1, complete with regulator and terminal board for connection to power supply, auxiliary controls and the PTH2 room thermostat (HWD only).

**NOTE (HWDE only):** for the complete operation of the unit, a valve must be installed for each water coil used. If valves are not used on the machine, the wiring of the power supply to the fan must be modified, as shown in the electrical connection diagram on page 11. The "fan" function will be eliminated as a consequence.

### RECEIVER PANEL (HWDE ONLY)

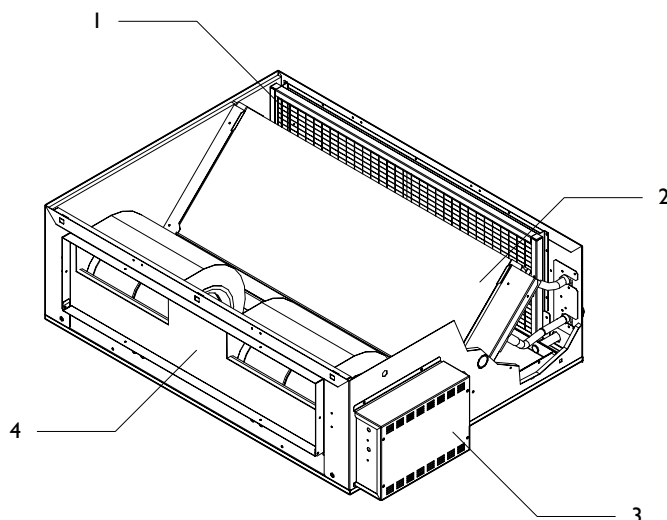
Wall mounted panel with connection terminal board, infrared receiver, LED display and reset/programming button.

### REMOTE CONTROL (HWDE ONLY)

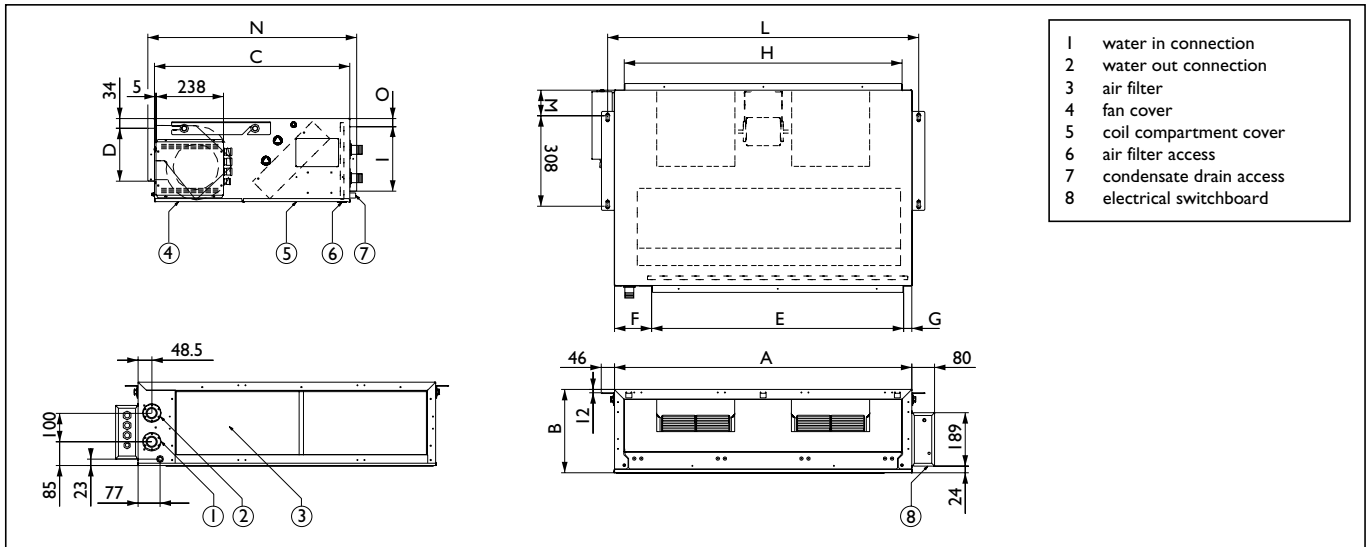
Infrared remote control unit with LCD display and keypad for selecting operating mode.

### ACCESSORIES (see page 24)

- Two-way intake plenum with damper
- Air purification module
- Activated carbon filter
- hot water heat exchange module
- intake plenum
- delivery plenum
- electric heater module:  
(3 kW for sizes 602-703-803-904)  
(4.5 kW for sizes 1003-1104)
- steam humidifier module with humidistat
- Discharge plenum for round ducting  
(4 x 160mm diam. for sizes 602-703-803-904)  
(4 x 200mm diam. for sizes 1003-1104)
- Condensate drain pump
- Remote control unit/receiver wall mounting bracket kit (HWDE only)
- PTH2 room thermostat, OFF, summer-winter, 3 speed and auxiliary controls.



- |   |                                 |
|---|---------------------------------|
| 1 | Air filter                      |
| 2 | Finned coil                     |
| 3 | Complete electrical switchboard |
| 4 | Fan assembly                    |



Size	Dimensions (mm)												
HWD-HWDE	A	B	C	D	E	F	G	H	I	L	M	N	O
602 - 703	900	295	690	187	750	116	34	750	187	950	72	738	34
803 - 904	1050	295	690	187	890	131	29	982	228	1100	72	738	29
1003 - 1104	1250	315	750	237	982	134	134	982	237	1300	102	798	34

Size	Connections		Weight
HWD-HWDE	Ø 1	Ø 2	(kg)
602 - 703	1/2" Gas	1/2" Gas	41-43
803 - 904	3/4" Gas	3/4" Gas	50-52
1003 - 1104	1" Gas	1" Gas	68-70

## INSTALLATION

### CHOICE OF INSTALLATION SITE

Before installing the unit, agree the site where it will be installed with the customer, taking the following points into consideration:

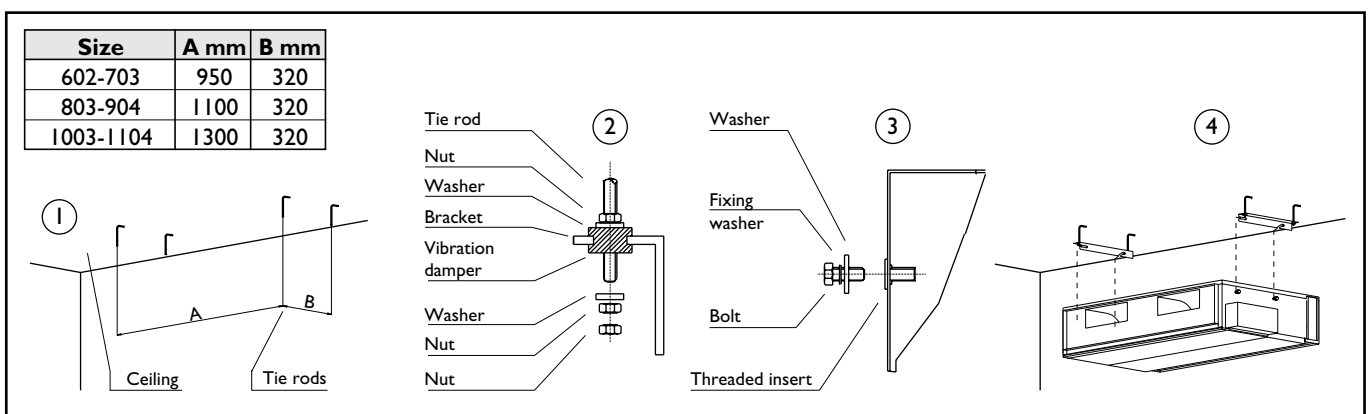
- check that the fixing points are adequate to support the weight of the unit;
- pay scrupulous respect to safety distances between the unit and other equipment or structures (see Minimum Installation Distances);
- install the unit with a minimum slope of 2 mm/m to guarantee condensate drainage.

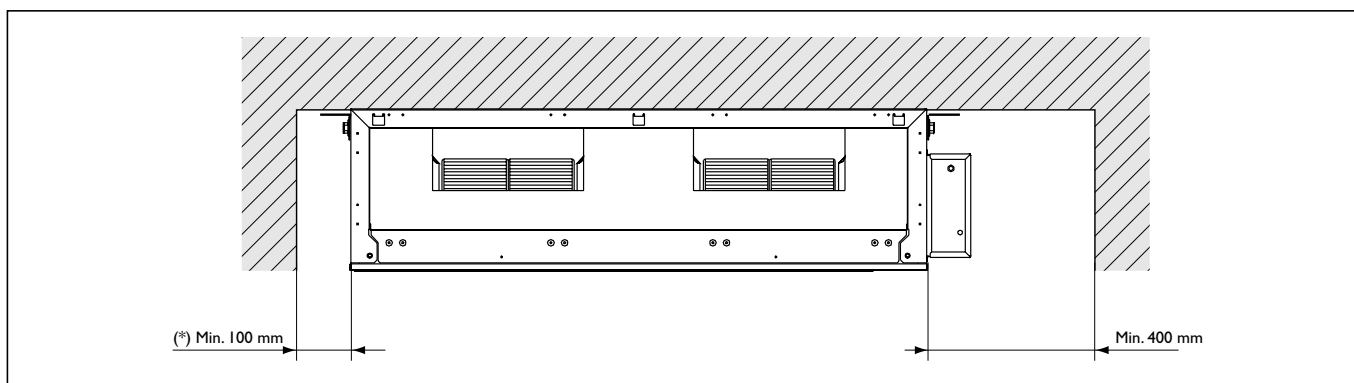
### POSITIONING

Before handling the unit, check the capacity of the lift equipment used, respecting the instructions on the packaging.

To move the unit horizontally, make appropriate use of lift trucks or similar.

Units are supplied with the following accessories to simplified installation: support brackets, threaded tie rods for ceiling fixing, vibration dampers, washers and fixing bolts. The figure below illustrates the installation procedure.





**Note:** the unit must slope by at least 2 mm/m towards the condensate drain.

(\*) Min. 400mm only if the Air purifier Module is fitted.

## HYDRAULIC CONNECTIONS

I

A

### WATER PIPE CONNECTION

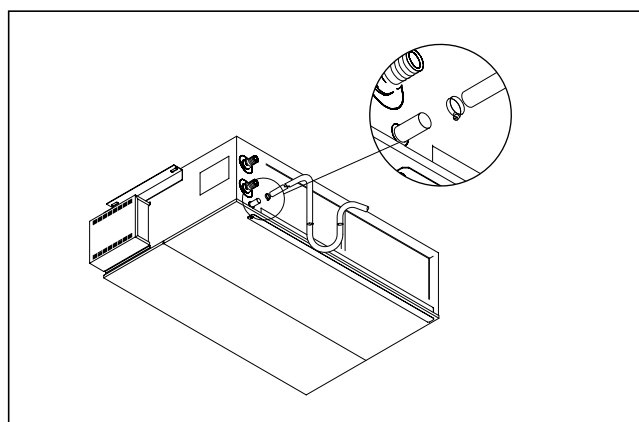
Make sure the diameter of the water pipes is adequate for the actual length of the piping and in any case not less than the diameter of the connection on the unit. When connecting the water pipes to the coil, take care not to damage the coil manifold. During this operation, hold the coil connections firm with a spanner to avoid damaging them. The fittings are located on the back of the unit looking at the air outlets.

### CONNECTING THE WATER PIPING

This operation must be carried out with particular care. The unit is fitted with a gravity drainage condensate drain pan with an open connection on the back of the unit. The pipe should have an internal diameter of at least 16 mm. The drain connection has an external diameter of 18 mm. Proceed according to the following instructions (see figure).

1. Connect the condensate drain hose to the pan outlet with a hose clip.
2. Make sure the drain pipe has a slope of at least 2 cm/m without obstructions or bottlenecks.
3. Fit a siphon. By eliminating the pressure drop caused by the fan, this prevents air being sucked up by the drain hose.

4. Connect the condensate drain pipe to a rainwater drainage system. Do not connect to the sewage system as odours may be sucked up if the water in the siphon evaporates.
5. After connecting, check correct drainage of the condensate by pouring water into the pan.



### IMPORTANT

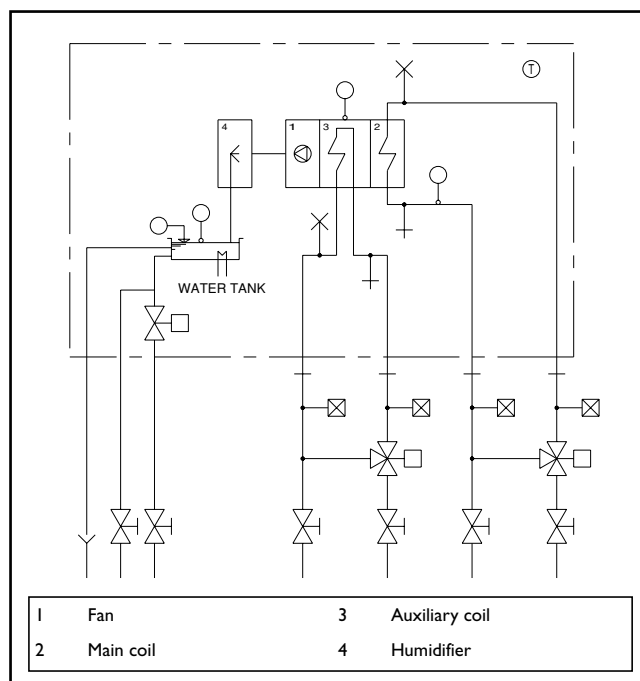
gravity drainage may be converted into forced drainage by fitting the condensate drain pump available as an accessory.



## HYDRAULIC CIRCUIT

For correct operation of the unit, the BTI room sensor must be positioned directly in the inflow of air (BTI sensor cable length: 3m).

**Warnings:** if the humidifier module is present, the overflow pipe and seasonal drain valve should be connected, as described in the paragraph “connecting the condensate drain pipe”. For the diameter of the connections, see page 26.



## I A

## POWER CONNECTIONS

**HWD-HWDE** hydronic terminals leave the factory completely wired and ready for connection to the mains electricity supply, the auxiliary devices, the accessories and the receiver.

The receiver must be connected using shielded cable to avoid radio interference that could lead to malfunction. All electrical connections must be carried out by qualified personnel. For all electrical work, refer to the electrical wiring diagrams in this manual.

You are also recommended to check that:

the characteristics of the mains electricity supply are adequate for the absorptions indicated in the electrical characteristics table below, also bearing in mind the possible use of other equipment at the same time.

**⚠ Power to the unit** must be turned on only after installation work (mechanical, refrigerant and electrical) has been completed.

**All electrical connections** must be carried out by qualified personnel in accordance with legislation in force in the country concerned.

**⚠ Respect instructions** for connecting phase, neutral and earth conductors.

**The power line** should be fitted upstream with a suitable device to protect against short-circuits and leakage to earth, isolating the installation from other equipment. This protection device should also act as a main switch and, if not visible from the electrical switchboard of the unit, should be lockable.

**Voltage must be** within a tolerance of  $\pm 10$  of the rated power supply voltage for the unit. If this is not the case, contact the electricity supply company.

**For electrical connections**, use double insulation cable in conformity with current legislation in the country concerned.

**An efficient earth connection is obligatory.** Failure to earth the appliance absolves the manufacturer of all liability for damage.

**⊘ Do not use water pipes to earth the unit.**

## ELECTRICAL ABSORPTIONS

Size	Electrical power supply (V-Ph-Hz)	Rated values (1)		Max. values (2)	
		F.L.I. (kW)	F.L.A. (A)	F.L.I. (kW)	F.L.A. (A)
<b>602 - 703</b>	230~50	0,30	1,30	0,37	1,7
<b>803 - 904</b>	230~50	0,35	1,55	0,44	1,7
<b>1003</b>	230~50	0,52	2,30	0,90	3,3
<b>1104</b>	230~50	0,60	2,60	0,90	3,3

F.L.I. Absorbed power

F.L.A. Absorbed current

L.R.A. Compressor start-up current

(1) Outside air temperature 35°C - Room temperature 27°C, R.H., values refer to the lower rated voltage (50Hz).

(2) These values should be used to dimension protection switches and power cables.

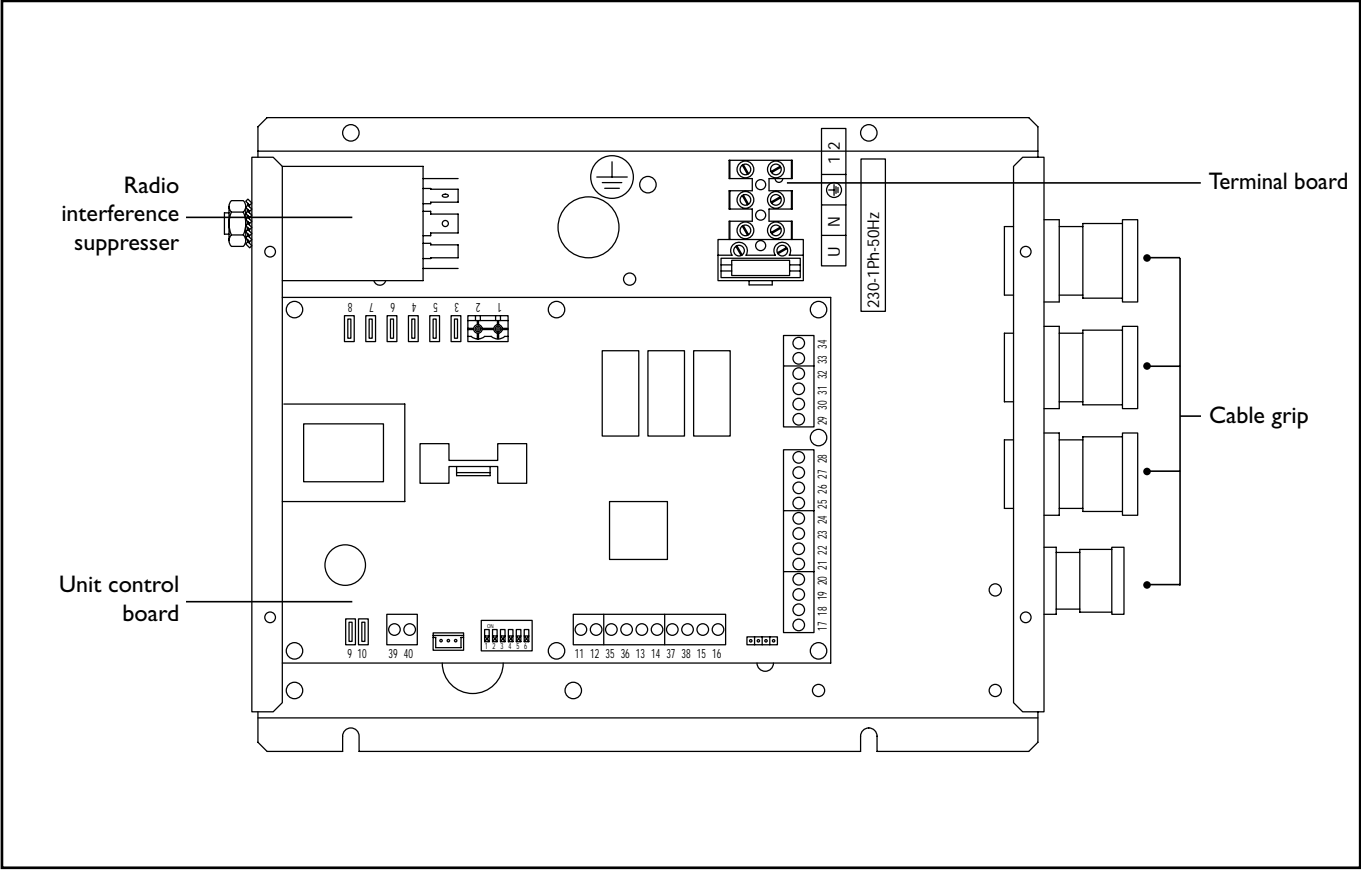
HYDRAULIC CONNECTIONS

To connect the unit, bring the power cable to the electrical switchboard inside the unit and connect it to the phase (L), neutral (N) and earth (PE) terminals, including a suitable main switch with automatic disconnector and residual current protection between the power line and the unit.

AUXILIARY CONNECTIONS

All the terminals referred to in the following explanations are to be found on the terminal board located on the electronic board.

ELECTRICAL SWITCHBOARD LAYOUT HWDE



To access the power supply board, remove the switchboard cover. This operation should be performed only with the main switch in the OFF position.

1-2	Humidifier output (A4 optional)	25-26	External unit defrosting indicator input I (F2)
3-4	Internal fan (EVI)	27-28	External unit shut down alarm (F3)
5-6-7-8	Board power supply	29-30	Cooling output (RL1)
9-10	Main coil temperature control sensor (BT2)	31-32	Heating output (RL2)
11-12	Condensate pump alarm input (F1)	33-34	Air purifier output (A3 optional)
13-14	Air intake assembly control sensor (BT1)	35-36	Auxiliary coil temperature control sensor (BT3)
15-16	0-10V output for electric heater or hot water coil modulating valve (optional SA2)	37-38	Output (0-10V) for main water coil modulating valve (SA3)
17-24	Remote control receiver input (A5)	39-40	Humidifier alarm input (F4)

PRELIMINARY CHECKS

To run functions 1, 2, 3, 4, 5, and 6 (if present), the corresponding DIP-SWITCH must be selected on the board.

ON

1 2 3 4 5 6

DIP-SWITCH

1

Auxiliary coil present (ON present)

2

Configuration output SA2-SA3 (valve or electric heater kit, OFF proportional 0-10V, ON on/off)

3

Fan calibration (ON active, see page 34)

4

Test mode (ON active)

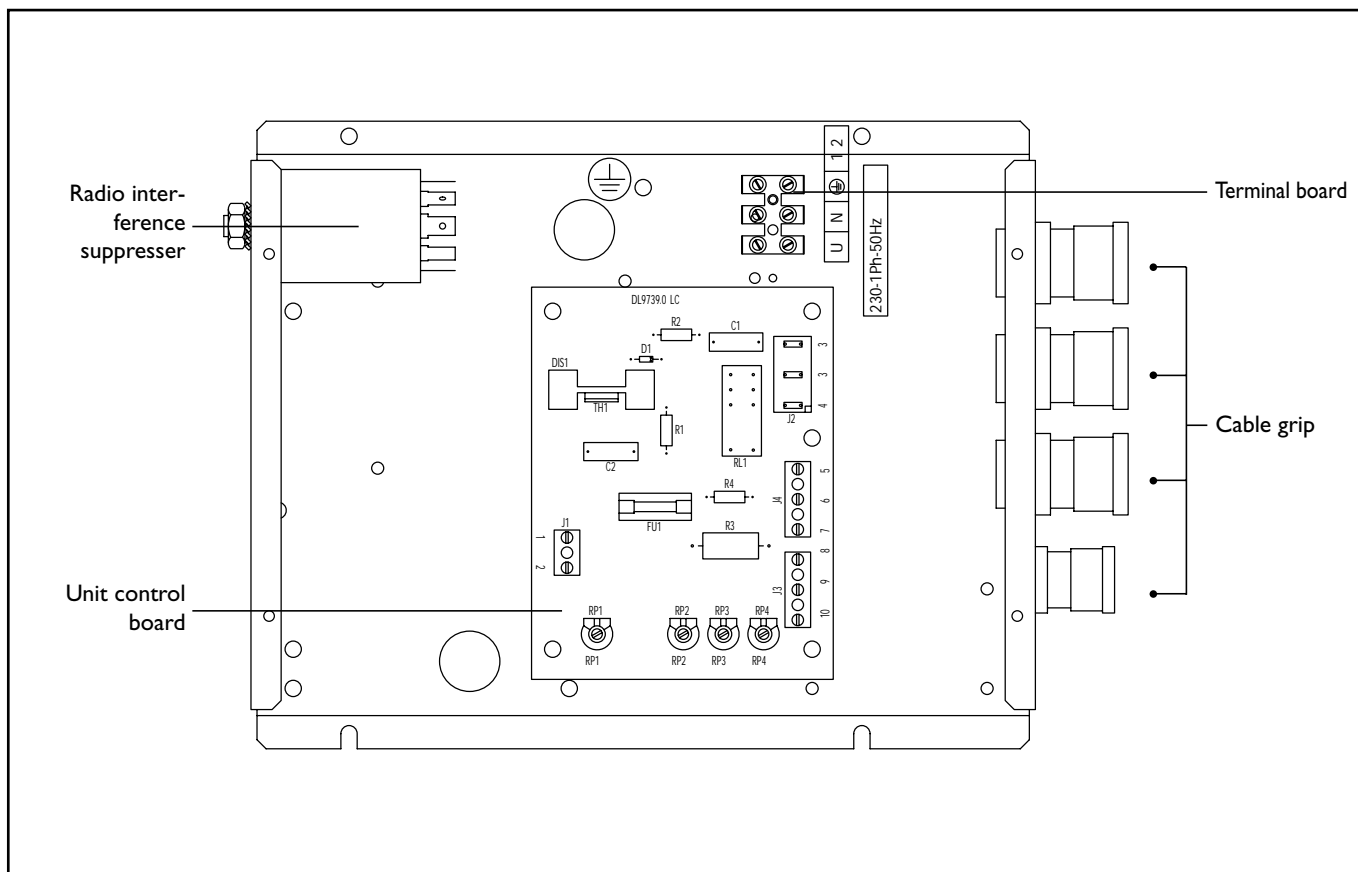
5

For HWDE, always OFF

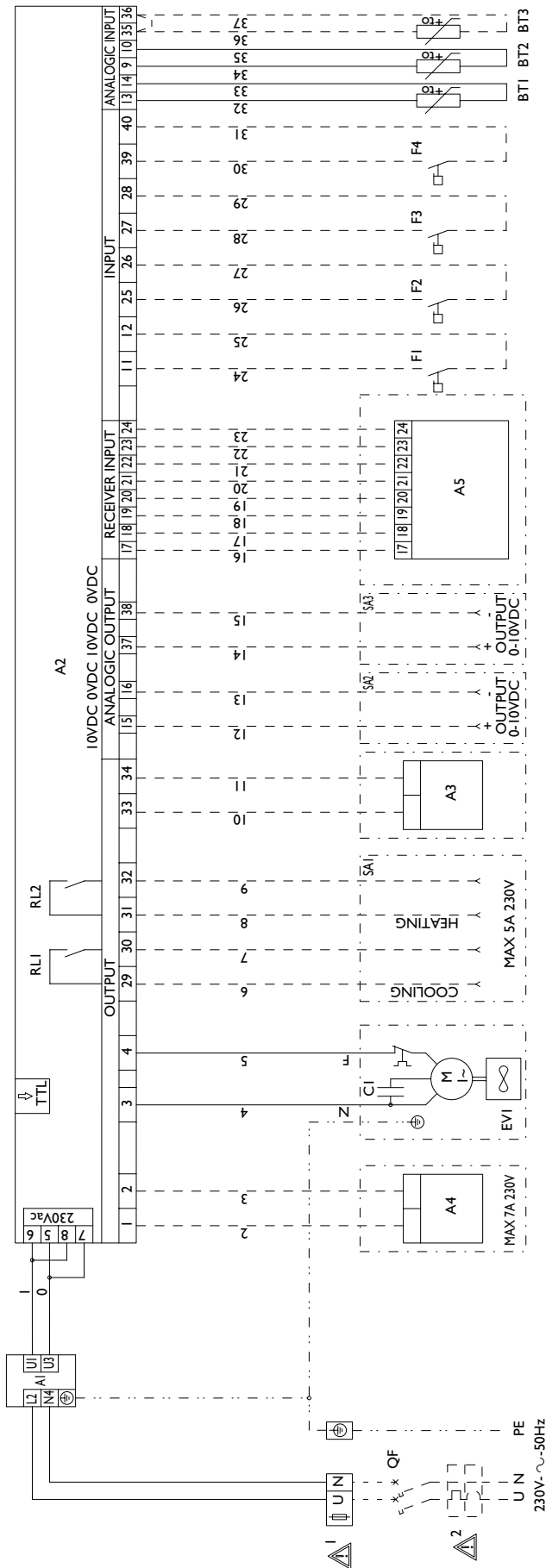
6

Cooling only or cooling and heating selector (ON cooling and heating)

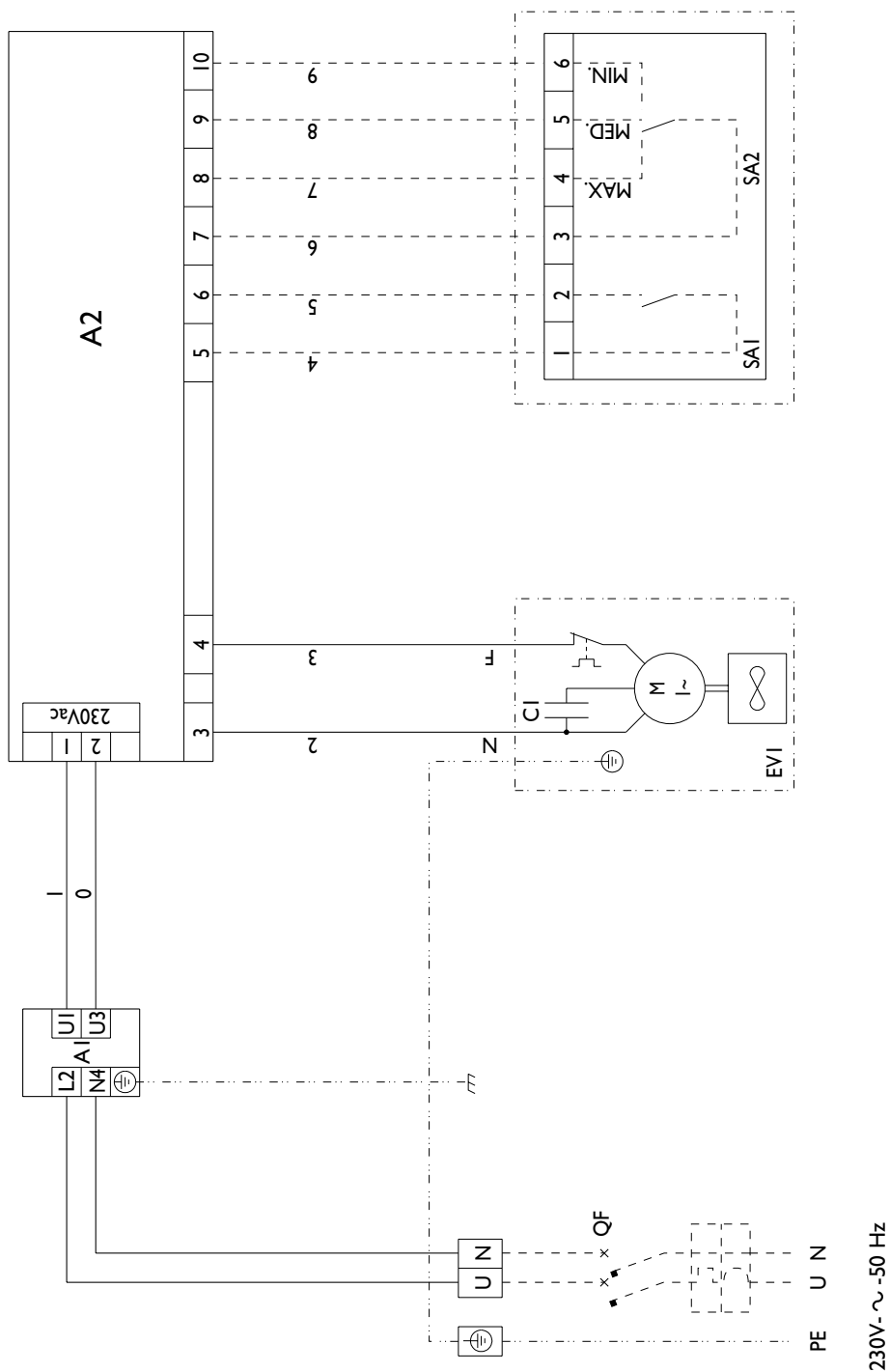
## ELECTRICAL SWITCHBOARD LAYOUT HWD



HWDE



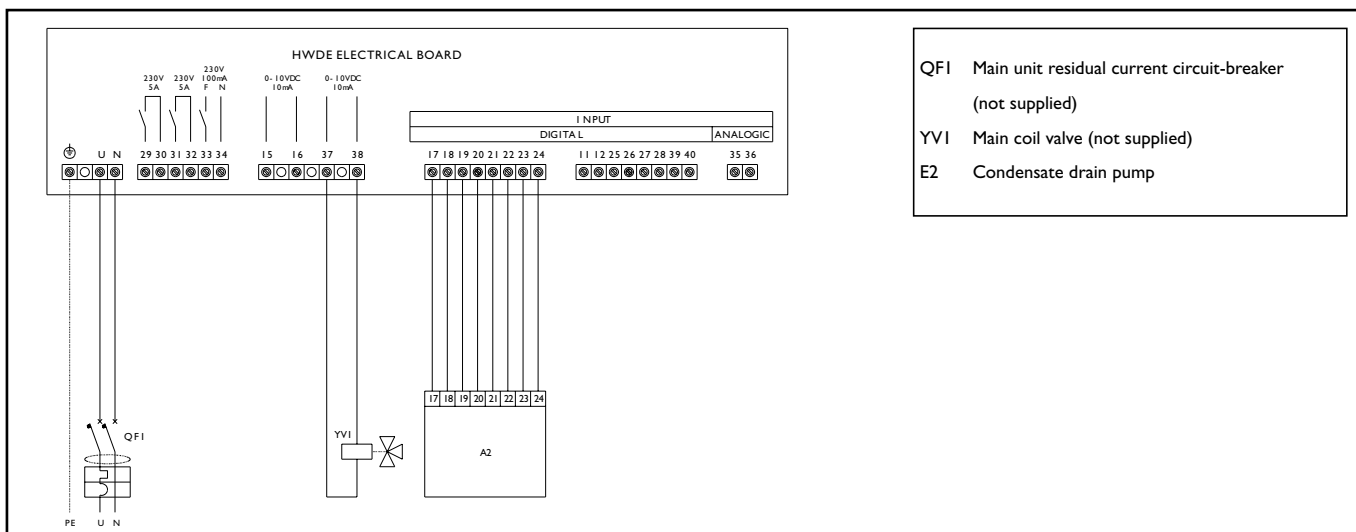
Factory installed components		Important	
A1	Radio interference suppressor	1	Terminal with fuse carrier
A2	Electronic controller	2	Customer's responsibility
A3	Air purifier (accessory)		
A4	Humidifier (accessory)		
A5	Receiver for remote control		
BT1	Air intake assembly temperature control sensor		
BT2	Main exchanger coil temperature control sensor		
BT3	Auxiliary exchanger coil temperature control sensor		
CI	Fan start capacitor		
EV1	Fan		
FI	Condensate pump alarm input		
F2	External unit defrosting indicator input		
F3	External unit shut down alarm		
F4	Humidifier shut down alarm		
QF	Assembly protection switch (customer's responsibility)		
SA1	Outputs for summer/winter switching thermostat signal		
SA2	Output for hot water coil modulating valve control or electric heater module control (accessories)		
SA3	Output for main water coil modulating valve control		



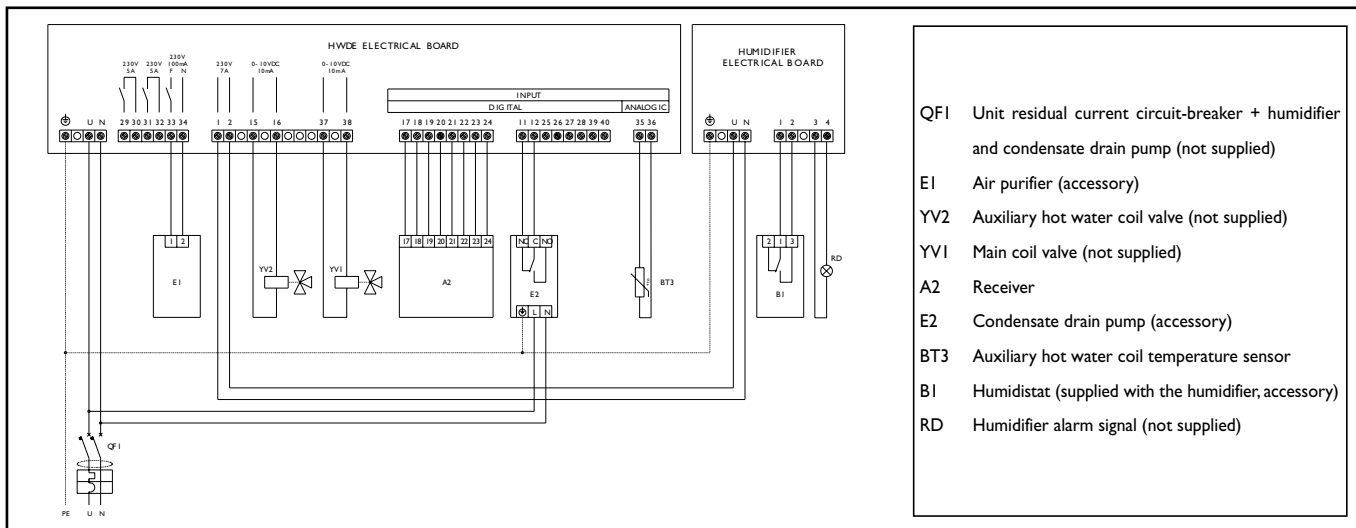
### Factory installed components

A1	Radio interference suppresser
A2	Electronic controller
BT	Room thermostat
C1	Fan start capacitor
EV1	Fan
QF	Assembly protection switch (customer's responsibility)
ST	Temperature sensor
IS1	Fan speed selector

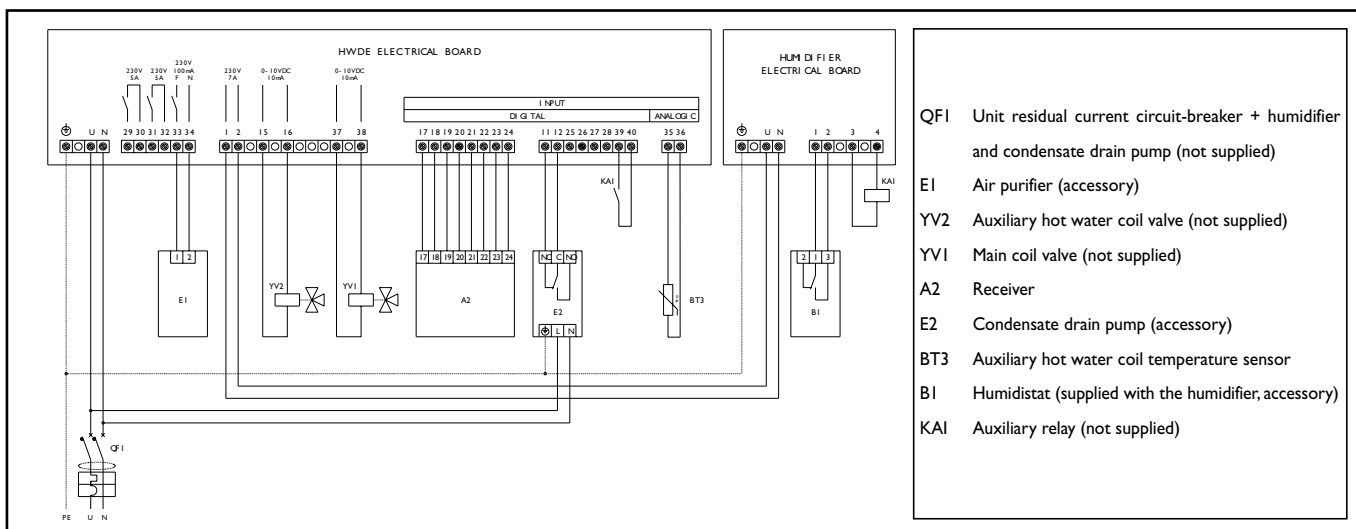
## Electrical connection diagram standard HWDE unit with valve for main coil



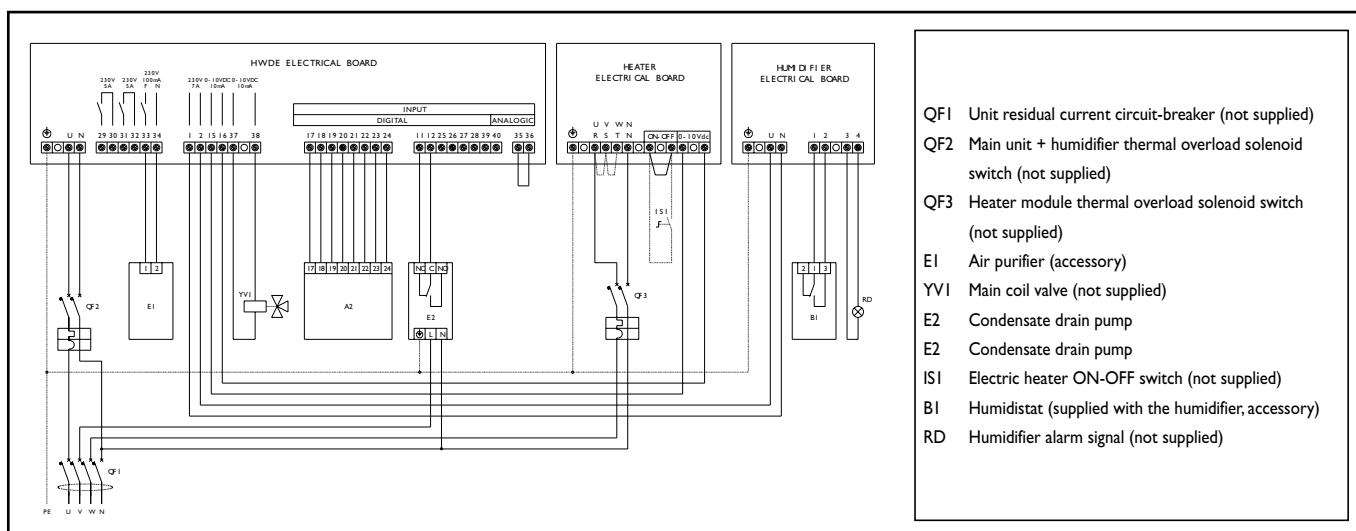
## Electrical connection diagram, standard HWDE unit with auxiliary water coil, valves and humidifier



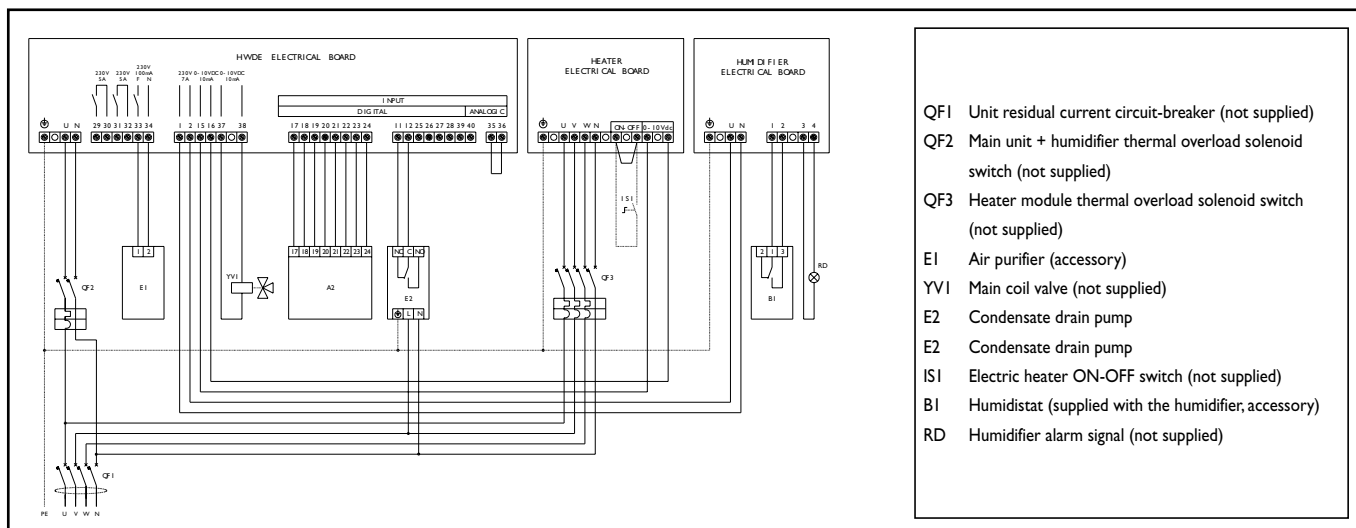
## Electrical connection diagram, standard HWDE unit with auxiliary water coil, valves and humidifier and alarm display on the receiver



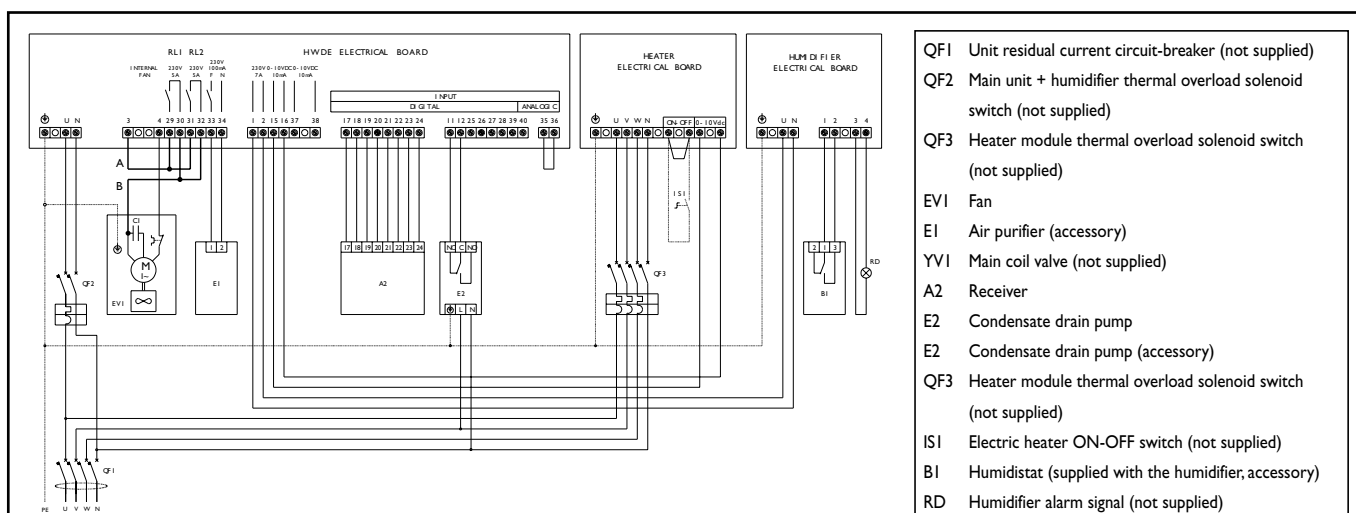
## Electrical connection diagram, standard HWDE unit with electric heater powered at 230~50, humidifier and valve on the main coil



## Electrical connection diagram, standard HWDE unit with electric heater powered at 400-3~50+N, humidifier and valve on the main coil



## Electrical connection diagram, standard HWDE unit without valves, with humidifier and electric heater



To carry out this connection, the fan must be recabled as shown above using the available cabling (A and B).  
This new connection does not allow operation in "fan mode"

The diagram illustrates the electrical connections between the HWD Electrical Board and the PTH2 unit. The HWD board features terminals 6 through 10 and a PE (Protective Earth) terminal. The PTH2 unit includes terminals 7, 0, 4, 6, 5, 8, 9, 3, 2, and 1, along with a temperature sensor (°C) and a switch (ST). The connections are as follows:

- Terminal 6 of the HWD board connects to terminal 7 of the PTH2 unit.
- Terminal 5 of the HWD board connects to terminal 0 of the PTH2 unit.
- Terminal 7 of the HWD board connects to terminal 4 of the PTH2 unit.
- Terminal 8 of the HWD board connects to terminal 6 of the PTH2 unit.
- Terminal 9 of the HWD board connects to terminal 5 of the PTH2 unit.
- Terminal 10 of the HWD board connects to terminal 8 of the PTH2 unit.
- The PE terminal of the HWD board connects to the PE terminal of the PTH2 unit.

Additional components and connections within the PTH2 unit include:

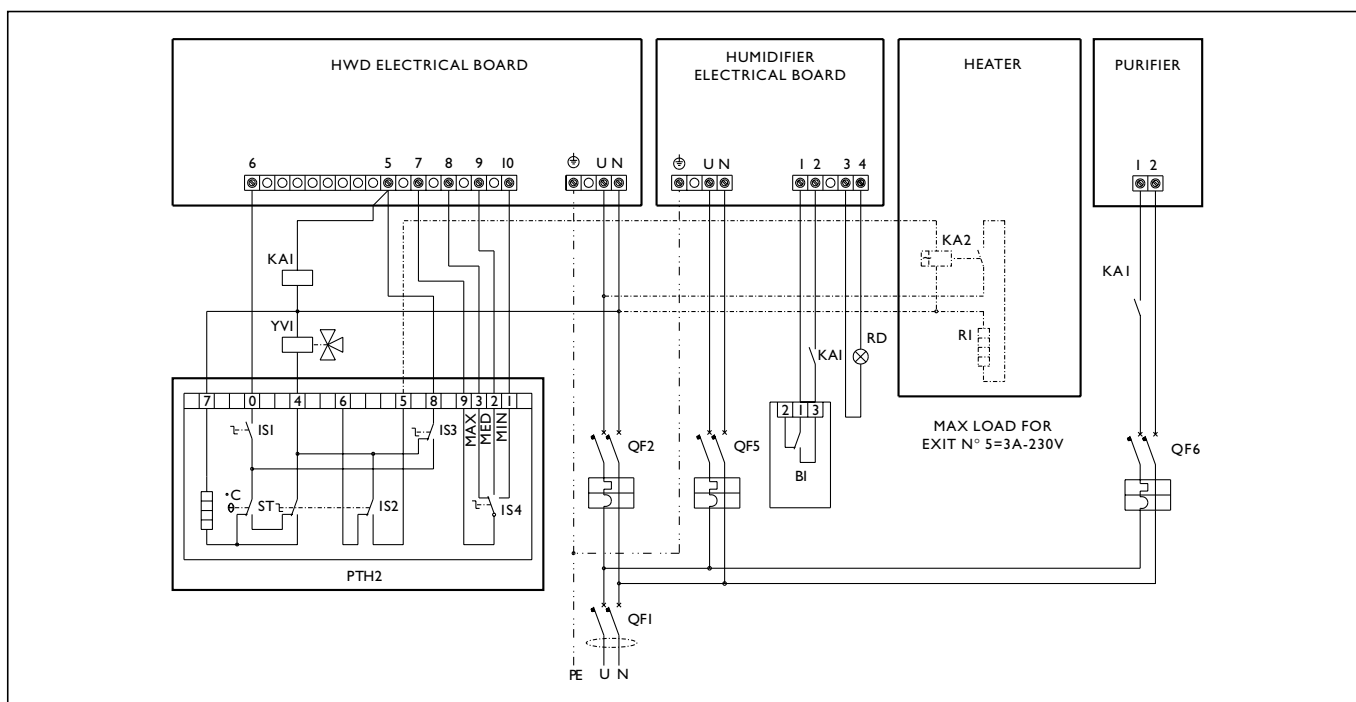
- A temperature sensor (°C) connected to terminal 7.
- A switch (ST) connected to terminal 0.
- Terminals 4, 6, 5, 8, 9, 3, 2, and 1 are connected to various internal components, including a fan (YVI) and a relay (IS1).
- Terminals 3, 2, and 1 are connected to a MAX/MED/MIN selector switch.
- Terminals 5, 8, 9, 3, 2, and 1 are connected to a relay (IS2).
- Terminals 7, 0, 4, 6, 5, 8, 9, 3, 2, and 1 are connected to a relay (IS3).
- Terminals 7, 0, 4, 6, 5, 8, 9, 3, 2, and 1 are connected to a relay (IS4).

The diagram illustrates the electrical wiring for a water treatment system. It features four main components: the HWD Electrical Board, the Humidifier Electrical Board, the Hot Water Heat Exchanger, and the Purifier. The HWD board includes terminals 6 through 10 and a ground connection. The Humidifier board has terminals 1 through 4 and a ground connection. The Hot Water Heat Exchanger and Purifier each have two terminals. The system is powered by a three-phase supply (U, V, W) and a ground (PE). The wiring includes various protective devices such as circuit breakers (QF1, QF2, QF5, QF6), fuses (F1, F2, F3, F4, F5, F6), and thermal relays (KA1, KA2). The diagram also shows the connection of the water treatment components to the electrical system, including the humidifier, heat exchanger, and purifier. A note indicates the maximum load for the exit is 3A at 230V.

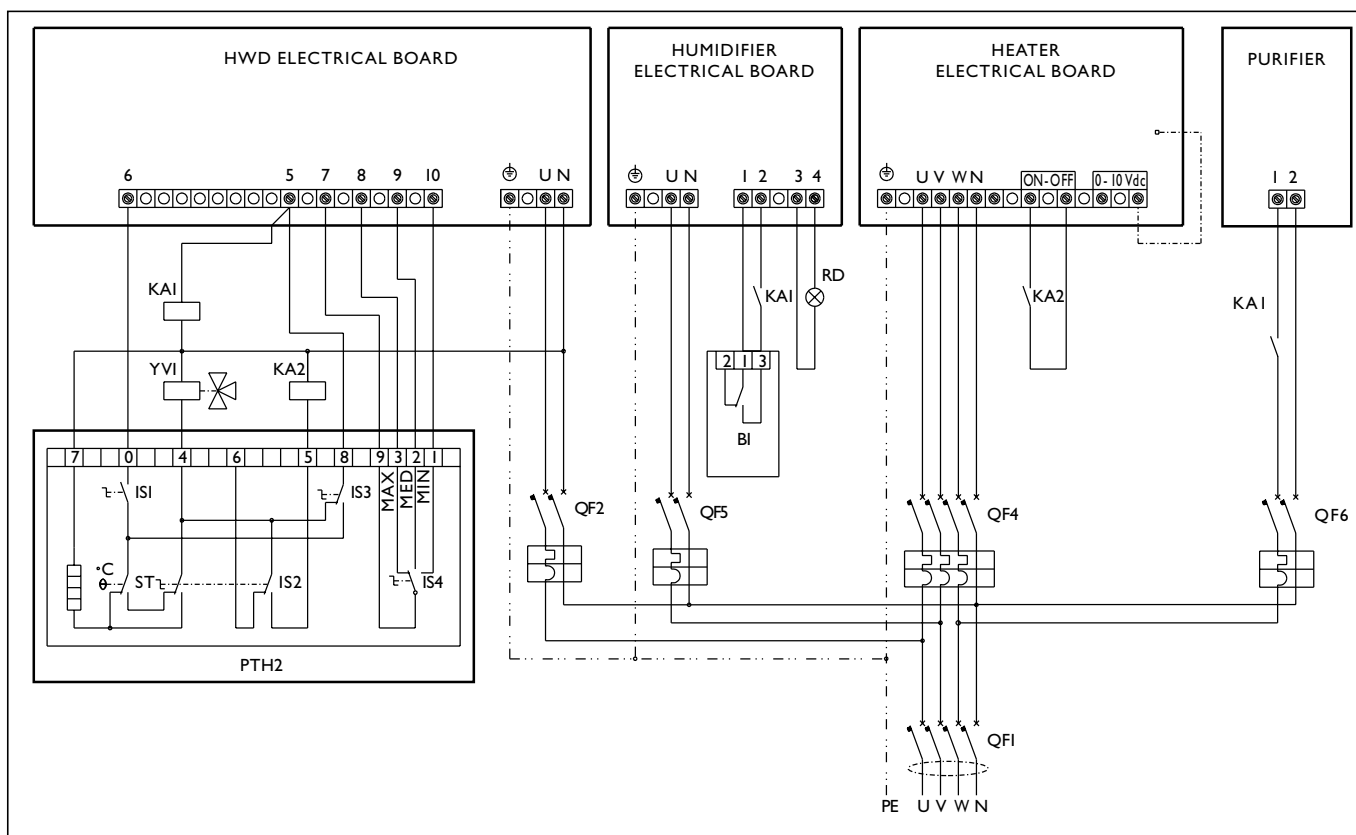
PTH2	Room thermostat	QF4	Heater coil protection switch	ST	Temperature sensor
QF2	Internal unit protection switch	FU1	Fuse	QF1	Assembly protection switch
RI	Heater coil	IS3	Automatic/manual selector	PR	Electrical heater reset button
IS1	On/off switch	YV1	Main coil valve	KA2	Heater coil auxiliary relay
QF5	Humidifier protection switch	KIT REC	Electronic condensing control	B1	Humidistat
RD	Alarm indicator light	IS4	Fan speed selector	QF6	Purifier protection switch
IS2	Summer/winter selector	KA1	Relay for humidifier/purifier control		



**Electrical connection diagram, standard HWD unit with general electric heater, humidifier and valves on the main coil**



**Electrical connection diagram, standard HWD unit with electric heater as standard, humidifier and valves on the main coil**



PTH2	Room thermostat	QF4	Heater coil protection switch	ST	Temperature sensor
QF2	Internal unit protection switch	FU1	Fuse	QF1	Assembly protection switch
R1	Heater coil	IS3	Automatic/manual selector	PR	Electric heater reset button
IS1	On/off switch	YV1	Main coil valve	KA2	Heater coil auxiliary relay
QF5	Humidifier protection switch	KIT REC	Electronic condensing control	BI	Humidistat
RD	Alarm indicator light	IS4	Fan speed selector	QF6	Purifier protection switch
IS2	Summer/winter selector	KA1	Relay for humidifier/purifier control		

Size		602	703	803	904	1003	1104
Total cooling capacity (1)	kW	5,2	6,6	8,5	10,2	12,1	15,8
Sensible cooling capacity (1)	kW	3,5	4,5	5,8	6,9	8,2	10,7
Heat output (2)	kW	5,0	6,3	7,4	9,3	11,3	14,5
Heating capacity supplementary coil (3)	kW	9,1	9,1	11,8	11,8	16,7	18,0
Pressure drop standard coil (1)	kPa	16	18	19	15	26	24
Pressure drop auxiliary coil (3)	kPa	9	9	14	14	13	15
Max absorbed power	kW	0,37	0,37	0,44	0,44	0,90	0,90
Absorbed current at nominal conditions	A	1,30	1,30	1,55	1,55	2,30	2,60
Current absorbed at maximum conditions	A	1,70	1,70	1,70	1,70	3,30	3,30
Number - diameter impellers	N°-mm	2-160	2-160	2-160	2-160	2-200	2-200
Rated air flow	m³/h	1300	1300	1600	1600	2200	2500
Useful head (basic unit with filter)	Pa	67	65	72	66	115	89
Standard coil hydraulic connections	Gas	1/2"	1/2"	3/4"	3/4"	1"	1"
Auxiliary coil hydraulic connections	Gas	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Weight	kg	41	43	50	52	63	65
Dimension (A)	mm	900	900	1050	1050	1250	1250
Dimension (B)	mm	690	690	690	690	750	750
Dimension (C)	mm	295	295	295	295	315	315
Sound pressure level minimum speed (4)	dB(A)	47	47	48	49	53	54
Sound pressure level speed average (4)	dB(A)	50	50	52	53	55	58
Sound pressure level speed maximum (4)	dB(A)	53	53	56	57	59	61
Electrical power supply	V-Ph-Hz	230~50					

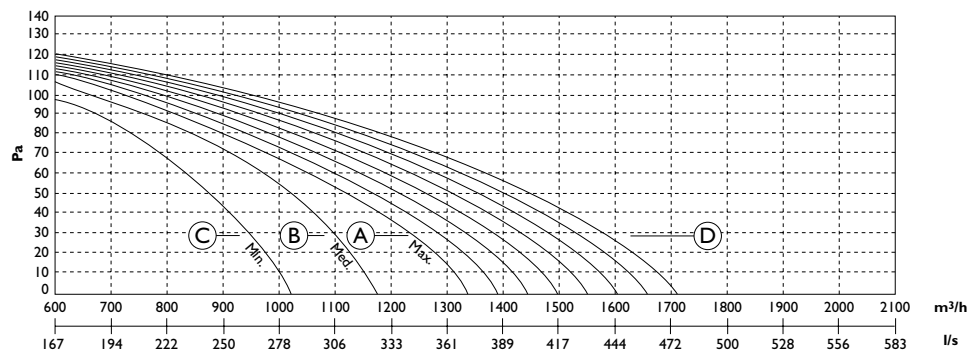
(1) Room temperature 27°C-50% R.H.; water in/out temperature 7/12°C

(2) Room temperature 20°C - 50% R.H.; water in/out temperature 45/40°C

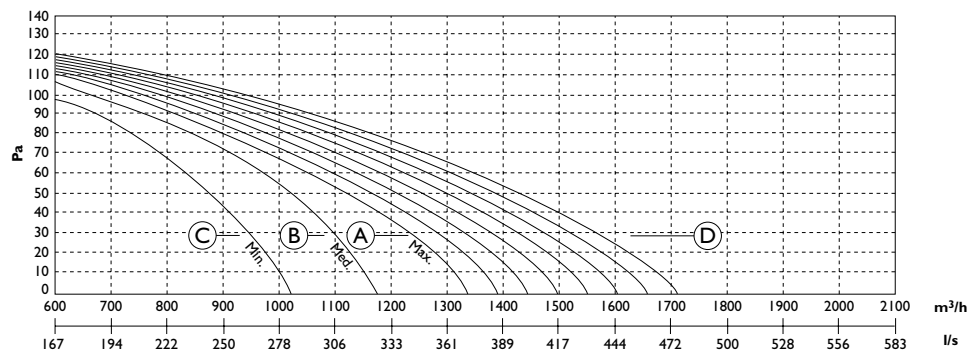
(3) Room temperature 20°C - 50% RH; water in/out temperature 70/60°C

(4) Measurement to 1 m by the point of air outlet

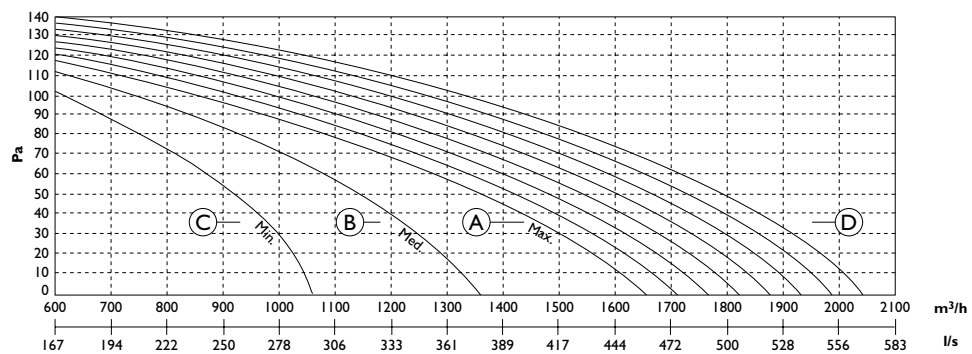
## PERFORMANCE CURVES HWD - HWDE 602



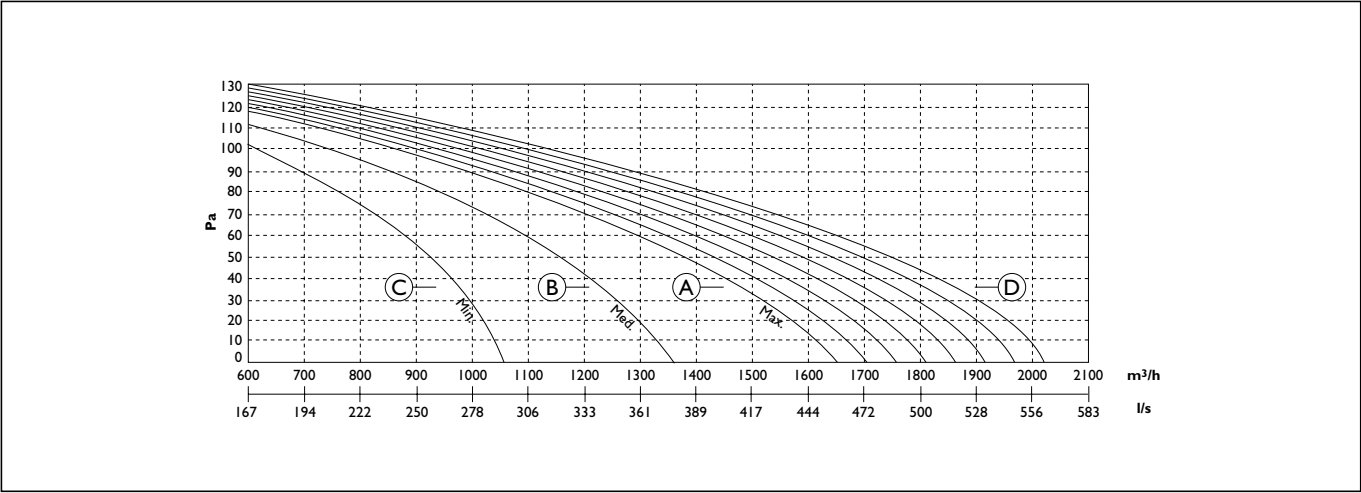
## PERFORMANCE CURVES HWD - HWDE 703



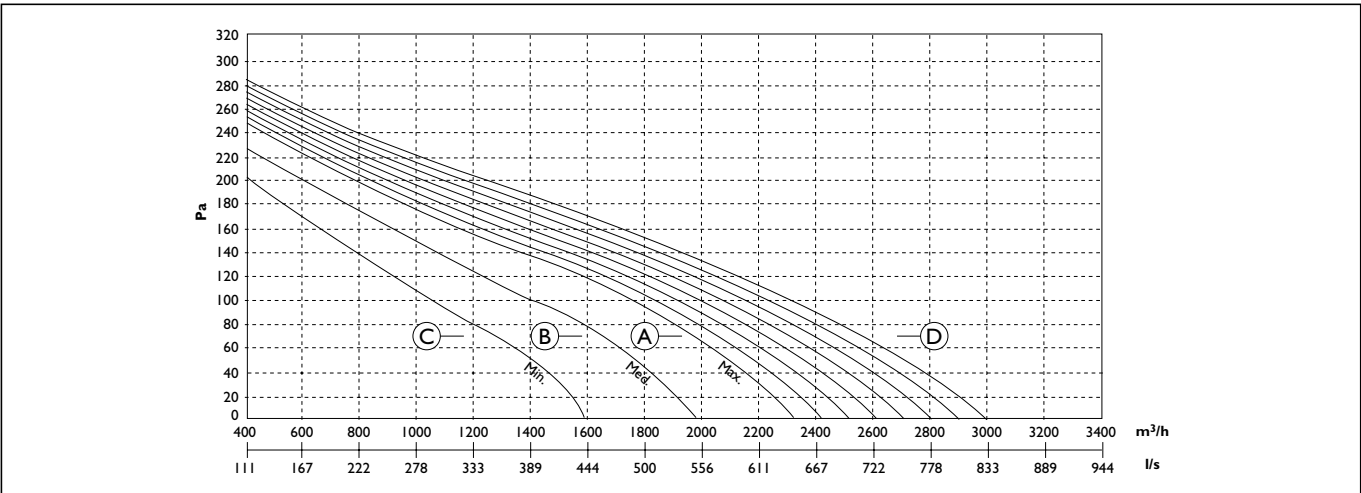
## PERFORMANCE CURVES HWD - HWDE 803



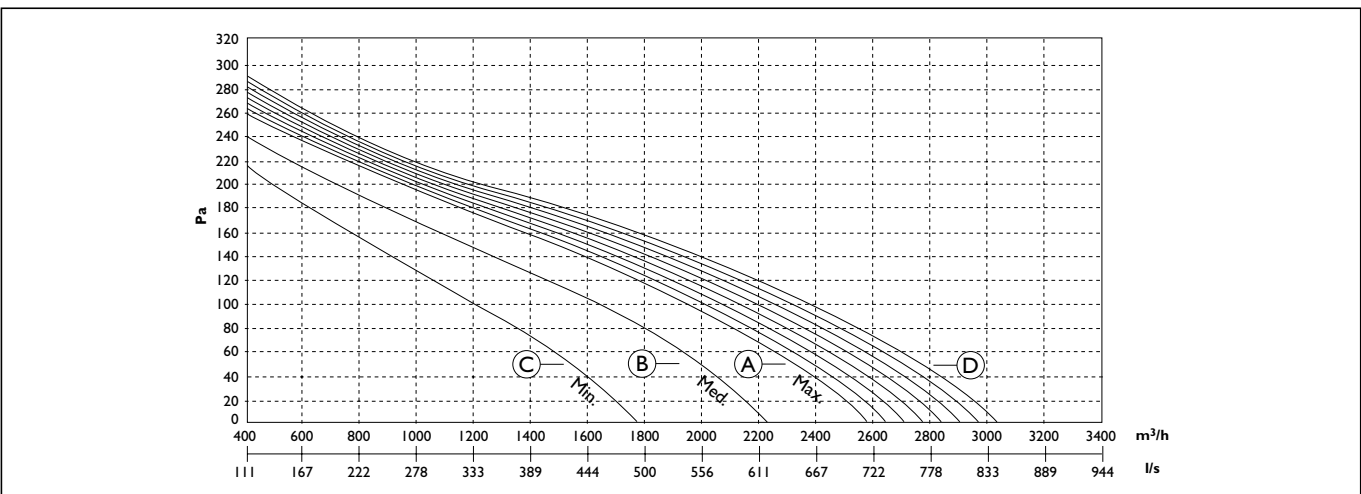
PERFORMANCE CURVES HWD - HWDE 904



PERFORMANCE CURVES HWD - HWDE 1003



PERFORMANCE CURVES HWD - HWDE 1104



## Maximum speed

Size 602			TAI 23°C - 50% UR				TAI 25°C - 50% UR				TAI 27°C - 50% UR				TAI 29°C - 50% UR				TAI 31°C - 50% UR				TAI 33°C - 50% UR			
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]
5,0	460	4,3	3,3	2,8	16,0	73,8	3,9	3,1	17,4	73,8	4,5	3,3	18,9	73,8	5,1	3,5	20,4	73,9	5,8	3,7	21,9	74,0	6,5	3,8	23,5	74,1
	890	16,0	4,3	3,3	14,9	73,9	5,2	3,6	16,1	74,1	6,0	3,9	17,4	74,3	6,9	4,2	18,7	74,7	7,9	4,4	20,0	75,0	8,9	4,7	21,4	75,4
	1.760	62,6	5,0	3,6	14,1	74,1	6,0	4,0	15,2	74,5	7,0	4,3	16,3	75,1	8,1	4,7	17,4	75,7	9,3	5,1	18,5	76,5	10,6	5,4	19,6	77,3
6,0	460	4,3	2,9	2,7	16,4	73,8	3,5	2,9	17,8	73,8	4,1	3,1	19,2	73,8	4,8	3,3	20,7	73,8	5,4	3,5	22,3	73,9	6,1	3,7	23,8	74,0
	890	16,0	3,9	3,1	15,3	73,8	4,7	3,4	16,6	73,9	5,6	3,7	17,8	74,1	6,5	4,0	19,1	74,4	7,4	4,3	20,4	74,7	8,4	4,6	21,8	75,1
	1.760	62,6	4,6	3,4	14,6	74,0	5,6	3,8	15,7	74,3	6,6	4,1	16,8	74,7	7,7	4,5	17,9	75,3	8,9	4,9	19,0	76,0	10,1	5,2	20,1	76,7
7,0	460	4,3	2,5	2,5	16,8	73,8	3,1	2,8	18,2	73,8	3,7	3,0	19,6	73,8	4,4	3,2	21,1	73,8	5,0	3,4	22,6	73,8	5,7	3,6	24,1	73,9
	890	16,0	3,5	2,9	15,8	73,8	4,3	3,2	17,0	73,8	5,2	3,5	18,2	74,0	6,1	3,8	19,5	74,2	7,0	4,1	20,8	74,5	8,0	4,4	22,2	74,8
	1.760	62,6	4,2	3,2	15,1	73,8	5,1	3,6	16,2	74,1	6,2	4,0	17,2	74,4	7,2	4,3	18,3	74,9	8,4	4,7	19,4	75,5	9,7	5,0	20,6	76,2
8,0	460	4,3	2,4	2,4	17,2	73,9	2,7	2,6	18,5	73,8	3,3	2,8	20,0	73,8	4,0	3,1	21,4	73,7	4,6	3,3	22,9	73,8	5,3	3,5	24,5	73,8
	890	16,0	3,1	2,7	16,2	73,8	3,9	3,1	17,4	73,8	4,7	3,4	18,7	73,9	5,6	3,7	19,9	74,0	6,6	4,0	21,2	74,3	7,6	4,2	22,5	74,6
	1.760	62,6	3,7	3,0	15,6	73,8	4,7	3,4	16,6	73,9	5,7	3,8	17,7	74,2	6,8	4,1	18,8	74,6	8,0	4,5	19,9	75,1	9,2	4,8	21,0	75,7
9,0	460	4,3	2,2	2,2	17,5	74,0	2,5	2,5	18,9	73,9	2,9	2,7	20,3	73,8	3,5	2,9	21,8	73,7	4,2	3,1	23,3	73,7	4,8	3,3	24,8	73,8
	890	16,0	2,6	2,6	16,7	73,8	3,4	2,9	17,9	73,8	4,3	3,2	19,1	73,8	5,2	3,5	20,3	73,9	6,1	3,8	21,6	74,1	7,1	4,1	22,9	74,3
	1.760	62,5	3,2	2,8	16,1	73,8	4,2	3,2	17,1	73,8	5,2	3,6	18,2	74,0	6,3	3,9	19,3	74,3	7,5	4,3	20,4	74,8	8,7	4,7	21,5	75,3
10,0	460	4,3	2,1	2,1	17,9	74,2	2,3	2,3	19,3	74,0	2,6	2,6	20,7	73,9	3,1	2,8	22,1	73,8	3,8	3,0	23,6	73,7	4,4	3,2	25,1	73,7
	890	16,0	2,4	2,4	17,1	73,9	3,0	2,7	18,3	73,8	3,8	3,0	19,5	73,8	4,7	3,3	20,8	73,8	5,7	3,6	22,0	74,0	6,7	3,9	23,3	74,2
	1.760	62,5	2,8	2,6	16,6	73,8	3,7	3,0	17,6	73,8	4,7	3,4	18,7	73,9	5,8	3,7	19,8	74,1	7,0	4,1	20,8	74,5	8,2	4,5	21,9	75,0

Pf: total capacity  
 Pfs: sensible capacity  
 Qw: flow rate of water at coil  
 dpw: pressure drop water side

Twi: water intake temperature  
 Tai: air intake temperature  
 Tau: air outlet temperature  
 Data refer to rated conditions.

## CCOOLING/HEATING CAPACITY CORRECTION FACTOR

Maximum speed: 1,0  
 Medium speed: 0,85  
 Minimum speed: 0,76

Size 703			TAI 23°C - 50% UR				TAI 25°C - 50% UR				TAI 27°C - 50% UR				TAI 29°C - 50% UR				TAI 31°C - 50% UR				TAI 33°C - 50% UR			
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]
5,0	610	5,2	4,4	3,7	14,0	81,8	5,1	4,0	15,2	81,8	5,9	4,2	16,6	81,9	6,7	4,5	17,9	82,0	7,5	4,7	19,4	82,1	8,4	4,9	20,8	82,2
	1.140	18,0	5,6	4,2	12,7	82,0	6,6	4,6	13,7	82,2	7,7	4,9	14,8	82,4	8,8	5,3	15,9	82,8	10,0	5,6	17,1	83,1	11,2	6,0	18,3	83,5
	2.240	69,5	6,4	4,6	11,7	82,2	7,7	5,0	12,6	82,6	8,9	5,5	13,4	83,2	10,3	5,9	14,3	83,8	11,8	6,4	15,2	84,6	13,3	6,8	16,2	85,4
6,0	610	5,2	3,9	3,5	14,5	81,8	4,7	3,8	15,7	81,8	5,4	4,0	17,0	81,8	6,2	4,3	18,4	81,9	7,1	4,5	19,8	82,0	7,9	4,8	21,2	82,1
	1.140	18,0	5,1	4,0	13,2	81,9	6,1	4,4	14,2	82,0	7,2	4,7	15,3	82,2	8,3	5,1	16,4	82,5	9,5	5,4	17,6	82,8	10,7	5,7	18,8	83,2
	2.240	69,5	5,9	4,3	12,3	82,0	7,1	4,8	13,2	82,4	8,4	5,3	14,0	82,8	9,8	5,7	14,9	83,4	11,2	6,1	15,8	84,1	12,8	6,6	16,8	84,8
7,0	610	5,1	3,4	3,3	15,0	81,9	4,2	3,6	16,2	81,8	5,0	3,9	17,5	81,8	5,7	4,1	18,8	81,8	6,6	4,4	20,2	81,9	7,4	4,6	21,7	82,0
	1.140	18,0	4,6	3,7	13,8	81,8	5,6	4,1	14,8	81,9	6,6	4,5	15,9	82,1	7,7	4,9	17,0	82,3	8,9	5,2	18,1	82,6	10,2	5,5	19,3	82,9
	2.240	69,5	5,3	4,1	12,9	81,9	6,6	4,5	13,8	82,1	7,8	5,0	14,6	82,5	9,2	5,5	15,5	83,0	10,6	5,9	16,4	83,6	12,2	6,3	17,3	84,3
8,0	610	5,1	3,1	3,1	15,4	81,9	3,7	3,4	16,7	81,8	4,4	3,7	17,9	81,8	5,2	3,9	19,3	81,8	6,1	4,2	20,6	81,8	6,9	4,4	22,1	81,9
	1.140	18,0	4,0	3,5	14,4	81,8	5,0	3,9	15,4	81,8	6,1	4,3	16,4	81,9	7,2	4,7	17,5	82,1	8,4	5,0	18,6	82,3	9,6	5,3	19,8	82,6
	2.240	69,5	4,8	3,8	13,6	81,8	6,0	4,3	14,4	82,0	7,3	4,8	15,2	82,3	8,6	5,2	16,1	82,7	10,1	5,7	17,0	83,2	11,6	6,1	19,5	83,8
9,0	610	5,1	2,9	2,9	15,9	82,0	3,2	3,2	17,1	81,9	3,9	3,5	18,4	81,8	4,7	3,8	19,7	81,8	5,5	4,0	21,1	81,8	6,4	4,3	22,5	81,8
	1.140	18,0	3,4	3,3	14,9	81,9	4,5	3,7	15,9	81,8	5,5	4,1	16,9	81,9	6,6	4,4	18,0	82,0	7,8	4,8	19,1	82,2	9,0	5,1	20,3	82,4
	2.240	69,5	4,2	3,6	14,2	81,8	5,4	4,0	15,0	81,9	6,7	4,5	15,8	82,1	8,0	5,0	16,7	82,4	9,5	5,4	17,6	82,8	11,0	5,9	18,5	83,4
10,0	610	5,1	2,7	2,7	16,4	82,2	3,0	3,0	17,6	82,0	3,4	3,3	18,9	81,9	4,2	3,6	20,1	81,8	5,0	3,8	21,5	81,8	5,8	4,1	22,9	81,8
	1.140	18,0	3,0	3,0	15,5	81,9	3,9	3,5	16,5	81,8	4,9	3,9	17,5	81,8	6,0	4,2	18,5	81,9	7,2	4,6	19,6	82,0	8,4	4,9	20,8	82,2
	2.240	69,5	3,6	3,3	14,8	81,8	4,8	3,8	15,6	81,8	6,0	4,3	16,4	81,9	7,4	4,7	17,3	82,2	8,8	5,2	18,2	82,5	10,4	5,6	19,1	83,0

Maximum speed

Size 803			TAi 23°C - 50% UR			TAi 25°C - 50% UR			TAi 27°C - 50% UR			TAi 29°C - 50% UR			TAi 31°C - 50% UR			TAi 33°C - 50% UR						
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]		
5,0	760	5,1	5,5	4,7	14,4	80,7	6,5	5,0	15,7	80,7	7,4	5,4	17,0	80,8	8,4	5,7	18,4	80,9	9,4	6,0	19,9	80,9	10,5	6,3
	1.470	19,0	7,2	5,4	13,0	80,9	8,5	5,9	14,0	81,1	9,9	6,4	15,2	81,3	11,3	6,8	16,3	81,7	12,8	7,3	17,5	82,0	14,4	7,7
	2.920	75,0	8,4	5,9	12,0	81,1	9,9	6,5	12,9	81,5	11,6	7,1	13,8	82,1	13,3	7,7	14,7	82,8	15,2	8,3	15,7	83,5	17,2	8,8
6,0	760	5,1	4,9	4,4	14,8	80,7	5,8	4,8	16,1	80,7	6,8	5,2	17,5	80,7	7,8	5,5	18,8	80,8	8,8	5,8	20,3	80,9	9,9	6,0
	1.470	19,0	6,6	5,1	13,5	80,8	7,9	5,6	14,6	80,9	9,2	6,1	15,7	81,1	10,7	6,6	16,8	81,4	12,2	7,0	18,0	81,7	13,8	7,4
	2.920	75,0	7,7	5,6	12,6	80,9	9,2	6,2	13,5	81,3	10,9	6,8	14,4	81,7	12,6	7,4	15,3	82,3	14,5	8,0	16,2	83,0	16,5	8,5
7,0	760	5,1	4,3	4,2	15,3	80,8	5,2	4,6	16,6	80,7	6,2	4,9	17,9	80,7	7,2	5,2	19,3	80,7	8,2	5,6	20,7	80,8	9,2	5,8
	1.470	19,0	5,9	4,8	14,1	80,7	7,2	5,3	15,1	80,8	8,5	5,8	16,2	81,0	10,0	6,3	17,3	81,2	11,5	6,7	18,5	81,5	13,1	7,2
	2.920	75,0	6,9	5,3	13,2	80,8	8,5	5,9	14,1	81,1	10,1	6,5	15,0	81,4	11,9	7,1	15,9	81,9	13,8	7,7	16,8	82,5	15,8	8,2
8,0	760	5,1	3,9	3,9	15,8	80,9	4,6	4,3	17,0	80,8	5,5	4,7	18,3	80,7	6,5	5,0	19,7	80,7	7,5	5,3	21,1	80,7	8,5	5,6
	1.470	19,0	5,2	4,5	14,6	80,7	6,5	5,0	15,7	80,7	7,8	5,5	16,7	80,8	9,3	6,0	17,8	81,0	10,8	6,5	19,0	81,2	12,4	6,9
	2.920	75,0	6,2	4,9	13,8	80,7	7,7	5,6	14,7	80,9	9,4	6,2	15,6	81,2	11,2	6,8	16,5	81,6	13,0	7,3	17,4	82,1	15,1	7,9
9,0	760	5,1	3,7	3,7	16,2	81,0	4,1	4,1	17,5	80,8	4,9	4,4	18,8	80,7	5,8	4,8	20,1	80,7	6,8	5,1	21,5	80,7	7,9	5,4
	1.470	19,0	4,4	4,2	15,2	80,8	5,7	4,8	16,2	80,7	7,1	5,3	17,3	80,8	8,5	5,7	18,4	80,9	10,0	6,2	19,5	81,1	11,6	6,6
	2.920	74,9	5,4	4,6	14,4	80,7	7,0	5,2	15,3	80,8	8,6	5,9	16,1	81,0	10,4	6,5	17,0	81,3	12,3	7,0	18,0	81,7	14,3	7,6
10,0	760	5,1	3,4	3,4	16,7	81,1	3,8	3,8	17,9	80,9	4,2	4,2	19,2	80,8	5,1	4,6	20,5	80,7	6,1	4,9	21,9	80,7	7,2	5,2
	1.470	19,0	3,9	3,9	15,7	80,9	5,0	4,5	16,7	80,7	6,3	5,0	17,8	80,7	7,8	5,5	18,9	80,8	9,3	5,9	20,0	80,9	10,8	6,4
	2.920	74,9	4,6	4,3	15,0	80,8	6,2	4,9	15,9	80,7	7,8	5,5	16,7	80,8	9,6	6,1	17,6	81,1	11,5	6,7	18,5	81,4	13,5	7,3

CCOOLING/HEATING CAPACITY CORRECTION FACTOR

Pf: total capacity  
Pfs: sensible capacity  
Qw: flow rate of water at coil  
dpw: pressure drop water side

Twi: water intake temperature  
Tai: air intake temperature  
Tau: air outlet temperature

Maximum speed: 1,0  
Medium speed: 0,85  
Minimum speed: 0,76

Data refer to rated conditions.

Size 904			TAi 23°C - 50% UR			TAi 25°C - 50% UR			TAi 27°C - 50% UR			TAi 29°C - 50% UR			TAi 31°C - 50% UR			TAi 33°C - 50% UR								
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]				
5,0	1.000	6,8	7,1	5,7	12,5	86,9	8,3	6,2	13,6	87,0	9,6	6,6	14,8	87,1	10,9	7,0	16,0	87,2	12,3	7,4	17,3	87,3	13,7	7,7	18,7	87,4
	1.760	21,0	8,6	6,4	11,2	87,0	10,2	7,0	12,1	87,3	11,8	7,5	13,1	87,5	13,5	8,1	14,0	87,8	15,3	8,6	15,1	88,2	17,2	9,1	16,2	88,6
	3.400	78,4	9,8	6,9	10,3	87,3	11,6	7,6	10,9	87,6	13,5	8,3	11,7	88,1	15,6	8,9	12,4	88,8	17,7	9,6	13,2	89,5	20,1	10,2	14,0	90,3
6,0	1.000	6,8	6,4	5,4	13,0	86,9	7,6	5,9	14,1	86,9	8,9	6,3	15,3	87,0	10,2	6,7	16,5	87,1	11,5	7,1	17,8	87,2	12,9	7,5	19,1	87,3
	1.760	21,0	7,9	6,0	11,9	87,0	9,4	6,6	12,7	87,1	11,0	7,2	13,7	87,3	12,7	7,7	14,6	87,6	14,5	8,3	15,7	87,9	16,5	8,8	16,8	88,3
	3.400	78,4	8,9	6,5	11,0	87,1	10,8	7,2	11,6	87,4	12,7	7,9	12,3	87,8	14,7	8,6	13,1	88,3	16,9	9,3	13,9	89,0	19,3	9,9	14,7	89,7
7,0	1.000	6,8	5,6	5,1	13,6	86,9	6,9	5,6	14,7	86,9	8,1	6,0	15,8	86,9	9,4	6,5	17,0	87,0	10,8	6,8	18,3	87,1	12,1	7,2	19,6	87,2
	1.760	21,0	7,1	5,7	12,5	86,9	8,6	6,3	13,4	87,0	10,2	6,9	14,3	87,2	11,9	7,4	15,2	87,4	13,7	8,0	16,3	87,7	15,6	8,5	17,3	88,0
	3.400	78,4	8,1	6,1	11,7	87,0	9,9	6,8	12,3	87,2	11,8	7,5	13,0	87,5	13,9	8,2	13,8	88,0	16,1	8,9	14,5	88,5	18,4	9,5	15,3	89,2
8,0	1.000	6,8	4,9	4,8	14,2	86,9	6,1	5,3	15,2	86,9	7,3	5,7	16,4	86,9	8,6	6,2	17,6	86,9	10,0	6,6	18,8	87,0	11,4	7,0	20,1	87,1
	1.760	21,0	6,2	5,3	13,1	86,9	7,8	5,9	14,0	86,9	9,4	6,5	14,9	87,0	11,1	7,1	15,9	87,2	12,9	7,6	16,9	87,4	14,8	8,1	17,9	87,7
	3.400	78,4	7,2	5,7	12,4	86,9	9,1	6,5	13,0	87,0	11,0	7,2	13,7	87,3	13,0	7,9	14,4	87,7	15,2	8,5	15,2	88,2	17,5	9,2	16,0	88,7
9,0	1.000	6,8	4,4	4,4	14,8	87,0	5,3	5,0	15,8	86,9	6,5	5,4	16,9	86,9	7,8	5,9	18,1	86,9	9,2	6,3	19,3	86,9	10,5	6,7	20,6	87,0
	1.760	21,0	5,4	5,0	13,8	86,9	6,9	5,6	14,6	86,9	8,6	6,2	15,5	86,9	10,3	6,8	16,5	87,1	12,1	7,3	17,4	87,3	13,9	7,8	18,5	87,5
	3.400	78,3	6,3	5,4	13,1	86,9	8,2	6,1	13,7	86,9	10,1	6,8	14,4	87,1	12,1	7,5	15,1	87,4	14,3	8,2	15,9	87,8	16,6	8,8	16,6	88,3
10,0	1.000	6,8	4,1	4,1	15,3	87,1	4,7	4,7	16,4	87,0	5,7	5,1	17,5	86,9	7,0	5,6	18,6	86,9	8,3	6,0	19,8	86,9	9,7	6,4	21,1	86,9
	1.760	21,0	4,6	4,6	14,4	87,0	6,1	5,3	15,3	86,9	7,7	5,9	16,1	86,9	9,4	6,4	17,1	87,0	11,2	7,0	18,0	87,1	13,1	7,5	19,1	87,3
	3.400	78,3	5,4	5,0	13,8	86,9	7,2	5,7	14,4	86,9	9,2	6,4	15,1	87,0	11,2	7,1	15,8	87,2	13,4	7,8	16,5	87,6	15,7	8,5	17,3	88,0

Maximum speed

Size I003			TAI 23°C - 50% UR				TAI 25°C - 50% UR				TAI 27°C - 50% UR				TAI 29°C - 50% UR				TAI 31°C - 50% UR				TAI 33°C - 50% UR			
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]
5,0	1.150	9,8	8,2	6,7	14,0	81,2	9,6	7,3	15,2	81,3	11,1	7,8	16,5	81,3	12,7	8,3	17,8	81,5	14,3	8,7	19,2	81,6	16,0	9,2	20,6	81,7
	2.080	32,0	10,2	7,6	12,8	81,4	12,0	8,3	13,8	81,6	14,0	9,0	14,9	81,9	16,1	9,6	16,0	82,2	18,3	10,3	17,2	82,6	20,6	10,9	18,3	83,1
	4.060	122,0	11,6	8,2	11,9	81,6	13,8	9,1	12,7	82,0	16,1	9,9	13,6	82,6	18,6	10,8	14,5	83,3	21,3	11,6	15,4	84,1	24,2	12,3	16,4	84,9
6,0	1.150	9,8	7,3	6,3	14,5	81,2	8,8	6,9	15,7	81,2	10,3	7,5	16,9	81,3	11,8	8,0	18,3	81,4	13,4	8,4	19,6	81,5	15,1	8,9	21,1	81,6
	2.080	32,0	9,2	7,2	13,3	81,3	11,1	7,9	14,4	81,4	13,1	8,6	15,4	81,6	15,1	9,3	16,5	81,9	17,3	9,9	17,7	82,3	19,6	10,5	18,8	82,7
	4.060	121,9	10,6	7,8	12,5	81,4	12,8	8,6	13,3	81,7	15,2	9,5	14,2	82,2	17,7	10,3	15,1	82,8	20,3	11,1	16,0	83,5	23,2	11,9	16,9	84,3
7,0	1.150	9,8	6,4	6,0	14,9	81,2	7,9	6,6	16,1	81,2	9,3	7,1	17,4	81,2	10,9	7,6	18,7	81,3	12,5	8,1	20,1	81,4	14,1	8,5	21,5	81,5
	2.080	32,0	8,3	6,8	13,9	81,2	10,1	7,5	14,9	81,3	12,1	8,2	16,0	81,5	14,2	8,9	17,0	81,7	16,3	9,5	18,2	82,0	18,7	10,1	19,3	82,4
	4.060	121,9	9,6	7,3	13,1	81,3	11,8	8,2	13,9	81,5	14,2	9,0	14,8	81,9	16,6	9,9	15,7	82,4	19,3	10,7	16,6	83,0	22,2	11,5	17,5	83,8
8,0	1.150	9,8	5,6	5,6	15,4	81,3	6,9	6,2	16,6	81,2	8,4	6,8	17,9	81,2	10,0	7,3	19,2	81,2	11,5	7,8	20,5	81,3	13,2	8,2	21,9	81,4
	2.080	32,0	7,3	6,3	14,5	81,2	9,1	7,1	15,5	81,2	11,1	7,8	16,5	81,3	13,2	8,5	17,6	81,5	15,3	9,1	18,7	81,8	17,7	9,8	19,8	82,1
	4.060	121,9	8,6	6,9	13,7	81,2	10,8	7,7	14,6	81,4	13,1	8,6	15,4	81,7	15,6	9,4	16,3	82,1	18,2	10,3	17,2	82,6	21,1	11,1	18,1	83,3
9,0	1.150	9,8	5,2	5,2	15,9	81,4	6,0	5,9	17,1	81,3	7,5	6,4	18,3	81,2	9,0	7,0	19,6	82,1	10,6	7,5	20,9	81,2	12,2	7,9	22,3	81,3
	2.080	32,0	6,3	5,9	15,0	81,2	8,1	6,7	16,0	81,2	10,1	7,4	17,0	81,3	12,1	8,1	18,1	81,4	14,3	8,8	19,2	81,6	16,6	9,4	20,3	81,9
	4.060	121,9	7,5	6,4	14,3	81,2	9,7	7,3	15,2	81,3	12,0	8,2	16,0	81,5	14,5	9,0	16,9	81,8	17,2	9,8	17,7	82,3	20,0	10,6	18,6	82,8
10,0	1.150	9,8	4,9	4,9	16,4	81,5	5,5	5,5	17,6	81,3	6,5	6,1	18,8	81,2	8,0	6,6	20,1	81,2	9,6	7,1	21,4	81,2	11,2	7,6	22,7	81,2
	2.080	32,0	5,5	5,5	15,6	81,3	7,1	6,3	16,6	81,2	9,0	7,0	17,6	81,2	11,1	7,7	18,6	81,3	13,2	8,4	19,7	81,4	15,5	9,0	20,8	81,7
	4.060	121,8	6,4	6,0	14,9	81,2	8,6	6,9	15,8	81,2	10,9	7,7	16,6	81,3	13,4	8,6	17,5	81,6	16,0	9,4	18,3	81,9	18,9	10,2	19,2	82,4

Pf: total capacity  
Pfs: sensible capacity  
Qw: flow rate of water at coil  
dpw pressure drop water side

Twi: water intake temperature  
Tai: air intake temperature  
Tau: air outlet temperature

Maximum speed: 1,0  
Medium speed: 0,85  
Minimum speed: 0,76

CCOOILING/HEATING CAPACITY CORRECTION FACTOR

Data refer to rated conditions.

Size I104			TAI 23°C - 50% UR			TAI 25°C - 50% UR			TAI 27°C - 50% UR			TAI 29°C - 50% UR			TAI 31°C - 50% UR			TAI 33°C - 50% UR								
Twi [°C]	Qw [l/h]	dPw [kPa]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]	Pf [kW]	Pfs [kW]	Tau [°C]	UR [%]				
5,0	1.500	10,3	10,8	8,8	13,0	85,3	12,6	9,5	14,2	85,3	14,5	10,1	15,4	85,4	16,4	10,8	16,7	85,5	18,4	11,3	18,1	85,6	20,5	11,8	19,5	85,7
	2.720	34,0	13,4	9,9	11,7	85,4	15,8	10,8	12,6	85,6	18,3	11,7	13,6	85,9	20,9	12,5	14,7	86,2	23,7	13,3	15,8	86,6	26,7	14,1	16,9	86,9
	5.290	128,6	15,3	10,8	10,7	85,7	18,1	11,9	11,5	86,1	21,1	12,9	12,2	86,6	24,3	14,0	13,0	87,2	27,7	15,0	13,9	87,9	31,4	16,0	14,7	88,7
6,0	1.500	10,3	9,6	8,3	13,5	85,3	11,5	9,0	14,7	85,3	13,4	9,7	15,9	85,3	15,3	10,3	17,2	85,4	17,3	10,9	18,6	85,5	19,4	11,4	20,0	85,6
	2.720	34,0	12,2	9,4	12,3	85,3	14,6	10,3	13,2	85,5	17,1	11,2	14,2	85,7	19,7	12,0	15,3	86,0	22,5	12,8	16,3	86,3	25,4	13,6	17,5	86,6
	5.290	128,6	14,0	10,2	11,4	85,5	16,8	11,3	12,1	85,8	19,8	12,4	12,9	86,2	23,0	13,4	13,7	86,8	26,4	14,5	14,5	87,4	30,1	15,5	15,4	88,2
7,0	1.500	10,3	8,5	7,8	14,1	85,3	10,3	8,6	15,2	85,3	12,2	9,3	16,4	85,3	14,1	9,9	17,7	85,3	16,1	10,5	19,0	85,4	18,2	11,0	20,4	85,5
	2.720	34,0	10,9	8,8	12,9	85,3	13,3	9,8	13,8	85,4	15,8	10,7	14,8	85,5	18,5	11,5	15,8	85,7	21,2	12,4	16,9	86,0	24,2	13,1	18,0	86,3
	5.290	128,6	12,7	9,6	12,1	85,4	15,5	10,7	12,8	85,6	18,5	11,8	13,5	85,9	21,7	12,9	14,3	86,4	25,1	13,9	15,1	87,0	28,8	14,9	16,0	87,6
8,0	1.500	10,3	7,3	7,3	14,6	85,3	9,1	8,1	15,8	85,3	11,0	8,8	17,0	85,3	12,9	9,5	18,2	85,3	14,9	10,1	19,5	85,3	16,9	10,6	20,9	85,4
	2.720	34,0	9,6	8,3	13,5	85,3	12,0	9,2	14,5	85,3	14,5	10,2	15,4	85,4	17,2	11,0	16,4	85,6	19,9	11,9	17,5	85,8	22,9	12,7	18,6	86,1
	5.290	128,6	11,3	9,0	12,7	85,3	14,1	10,1	13,5	85,4	17,2	11,2	14,2	85,7	20,3	12,3	15,0	86,1	23,7	13,3	15,8	86,6	27,4	14,4	16,6	87,2
9,0	1.500	10,3	6,9	6,9	15,2	85,4	7,9	7,6	16,3	85,3	9,8	8,4	17,5	85,3	11,7	9,0	18,7	85,2	13,6	9,7	20,0	85,3	15,7	10,2	21,3	85,3
	2.720	34,0	8,3	7,7	14,2	85,3	10,7	8,7	15,1	85,3	13,2	9,6	16,0	85,3	15,8	10,5	17,0	85,4	18,6	11,4	18,0	85,6	21,5	12,2	19,1	85,9
	5.290	128,5	9,9	8,4	13,4	85,3	12,7	9,5	14,1	85,3	15,7	10,6	14,9	85,5	18,9	11,7	15,6	85,8	22,3	12,8	16,4	86,2	26,0	13,8	17,2	86,8
10,0	1.500	10,3	6,4	6,4	15,7	85,5	7,2	7,2	16,8	85,4	8,5	7,9	18,0	85,3	10,4	8,6	19,2	85,2	12,4	9,2	20,5	85,2	14,4	9,8	21,8	85,3
	2.720	34,0	7,2	7,2	14,8	85,4	9,3	8,2	15,7	85,3	11,8	9,1	16,6	85,3	14,5	10,0	17,6	85,3	17,2	10,9	18,6	85,5	20,1	11,7	19,7	85,7
	5.290	128,5	8,5	7,8	14,1	85,3	11,3	8,9	14,8	85,3	14,3	10,1	15,5	85,4	17,5	11,2	16,3	85,6	20,9	12,2	17,1	86,0	24,5	13,3	17,9	86,4

## Maximum speed

Size 602			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Tw <sub>i</sub> [°C]	Q <sub>w</sub> [l/h]	dP <sub>w</sub> [kPa]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]
40	460	4,2	6,9	17,0	5,2	22,8	4,3	25,7	3,8	27,4	3,5	28,5	3,1	29,7
	890	16,0	8,0	19,8	6,0	24,9	5,0	27,4	4,4	28,9	4,0	29,9	3,6	30,9
	1.760	62,5	8,8	21,7	6,6	26,3	5,5	28,6	4,8	30,0	4,4	30,9	4,0	31,8
45	460	4,2	7,8	19,3	6,1	25,0	5,2	27,9	4,7	29,6	4,3	30,7	4,0	31,9
	890	16,0	9,1	22,4	7,1	27,4	6,1	30,0	5,4	31,5	5,0	32,5	4,6	33,5
	1.760	62,5	9,9	24,5	7,7	29,1	6,6	31,3	6,0	32,7	5,5	33,6	5,1	34,5
50	460	4,2	8,7	21,5	7,0	27,2	6,1	30,1	5,6	31,8	5,2	32,9	4,9	34,1
	890	16,0	10,1	24,9	8,1	30,0	7,1	32,5	6,5	34,0	6,1	35,0	5,7	36,0
	1.760	62,5	11,0	27,2	8,8	31,8	7,7	34,1	7,1	35,5	6,6	36,4	6,2	37,3
60	660	8,8	11,5	28,5	9,6	33,8	8,7	36,5	8,1	38,0	7,7	39,1	7,3	40,1
	950	18,2	12,4	30,5	10,3	35,5	9,3	37,9	8,7	39,4	8,2	40,4	7,8	41,4
	1.500	45,4	13,1	32,4	10,9	37,0	9,8	39,3	9,2	40,7	8,7	41,6	8,3	42,5
70	670	9,0	13,6	33,6	11,7	38,8	10,7	41,4	10,1	43,0	9,7	44,0	9,3	45,1
	880	15,6	14,3	35,3	12,3	40,3	11,2	42,8	10,6	44,3	10,2	45,3	9,8	46,3
	1.230	30,5	15,0	37,1	12,9	41,8	11,8	44,1	11,2	45,6	10,7	46,5	10,3	47,4
80	460	4,2	14,3	35,3	12,5	40,9	11,6	43,7	1,1	45,4	10,7	46,5	10,4	47,7
	670	9,0	15,6	38,6	13,7	43,8	12,7	46,4	12,1	48,0	11,7	49,0	11,3	50,0
	1.090	24,0	16,9	41,9	14,8	46,7	13,8	49,0	13,1	50,5	12,7	51,4	12,3	52,4

Size 703			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Tw <sub>i</sub> [°C]	Q <sub>w</sub> [l/h]	dP <sub>w</sub> [kPa]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]
40	610	5,1	8,8	21,7	6,6	26,3	5,5	28,6	4,9	30,0	4,4	30,9	4,0	31,8
	1.140	18,0	10,1	24,9	7,6	28,7	6,3	30,6	5,6	31,7	5,0	32,5	4,5	33,2
	2.240	69,5	11,0	27,1	8,2	30,3	6,9	31,9	6,0	32,9	5,5	3,6	4,9	34,2
45	610	5,1	10,0	24,6	7,8	29,2	6,7	31,4	6,0	32,8	5,6	33,7	5,1	34,6
	1.140	18,0	11,4	28,1	8,9	31,9	7,6	33,8	6,8	34,9	6,3	35,7	5,8	36,4
	2.240	69,5	12,4	30,6	9,6	33,8	8,2	35,4	7,4	36,3	6,9	37,0	6,3	37,6
50	610	5,1	11,1	27,5	8,9	32,0	7,8	34,2	7,1	35,6	6,7	36,5	6,2	37,4
	1.140	18,0	12,7	31,3	10,1	35,1	8,9	36,9	8,1	38,1	7,6	38,8	7,1	39,6
	2.240	69,5	13,8	34,0	11,0	37,2	9,6	38,8	8,8	39,8	8,3	40,4	7,7	41,1
60	840	9,7	14,5	35,9	12,1	40,0	10,9	42,0	10,2	43,2	9,7	44,0	9,2	44,8
	1.180	19,2	15,4	38,2	12,9	41,8	11,6	43,7	10,8	44,8	10,3	45,5	9,8	46,2
	1.870	48,4	16,3	40,4	13,6	43,7	12,3	45,3	11,4	46,3	10,9	46,9	10,4	47,6
70	840	9,7	17,1	42,2	14,6	46,2	13,4	48,2	12,7	49,4	12,2	50,2	11,7	51,0
	1.100	16,7	17,9	44,2	15,4	47,9	14,1	49,8	13,3	50,9	12,8	51,6	12,3	52,4
	1.530	32,4	18,7	46,3	16,1	49,7	14,7	51,4	13,9	52,4	13,4	53,1	12,8	53,7
80	580	4,6	18,0	44,5	15,8	49,0	14,7	51,2	14,0	52,6	13,5	53,5	13,1	54,3
	850	10,0	19,7	48,6	17,2	52,5	16,0	54,5	15,3	55,7	14,8	56,5	14,3	57,3
	1.370	26,0	21,2	52,4	18,5	55,8	17,2	57,6	16,4	58,6	15,9	59,3	15,4	60,0

Size 803			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Tw <sub>i</sub> [°C]	Q <sub>w</sub> [l/h]	dP <sub>w</sub> [kPa]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]	P <sub>t</sub> [kW]	Tau [°C]
40	760	5,0	10,2	18,9	7,6	24,2	6,4	26,8	5,6	28,4	5,1	29,5	4,6	30,5
	1.470	19,0	11,8	21,9	8,9	26,5	7,4	28,7	6,5	30,1	5,9	31,0	5,3	31,9
	2.920	74,9	13,0	24,0	9,7	28,0	8,1	30,0	7,1	31,2	6,5	32,0	5,8	32,8
45	760	5,0	11,5	21,4	9,0	26,7	7,7	29,3	6,9	30,9	6,4	31,9	5,9	33,0
	1.470	19,0	13,4	24,8	10,4	29,3	8,9	31,6	8,0	32,9	7,4	33,8	6,8	34,7
	2.920	74,9	14,6	27,1	11,4	31,1	9,8	3,1	8,8	34,3	8,1	35,1	7,5	35,9
50	760	5,0	12,9	23,9	10,3	29,1	9,0	31,7	8,3	33,3	7,7	34,3	7,2	35,4
	1.470	19,0	14,9	27,6	11,9	32,1	10,4	34,3	9,5	35,7	8,9	36,6	8,4	37,5
	2.920	74,9	16,3	30,2	13,0	34,1	11,4	36,1	10,4	37,3	9,8	38,1	9,1	38,9
60	950	7,9	16,6	30,7	13,8	35,6	12,5	38,1	11,6	39,6	11,1	40,6	10,5	41,5
	1.370	16,5	17,9	33,1	14,9	37,6	13,4	39,9	12,5	41,2	11,9	42,1	11,3	43,0
	2.190	42,1	19,1	35,4	15,9	39,5	14,3	41,6	13,4	42,8	12,7	43,6	12,1	44,4
70	960	8,1	19,5	36,2	16,8	41,1	15,4	43,5	14,5	4,9	14,0	45,9	13,4	46,9
	1.270	14,1	20,7	38,3	17,7	42,9	16,3	45,1	15,4	46,5	14,8	47,4	14,2	48,3
	1.790	28,1	21,8	40,4	18,7	44,7	17,1	46,8	16,2	48,1	15,6	48,9	15,0	49,7
80	660	3,8	20,4	37,8	17,9	43,1	16,6	45,8	15,8	47,4	15,3	48,4	14,8	49,5
	970	8,2	22,5	41,8	19,7	46,6	18,3	49,0	17,5	50,4	16,9	51,4	16,4	52,3
	1.590	22,2	24,6	45,7	21,6	50,0	20,0	52,1	19,1	53,4	18,5	54,3	17,9	55,1

Pt: heat output

Tw<sub>i</sub>: water intake temperature

Tau: air outlet temperature

Data refer to rated conditions.

Tai: air intake temperature

Q<sub>w</sub>: flow rate of water at coil

dpw: pressure drop water side

## COOLING/HEATING CAPACITY CORRECTION FACTOR

Max speed: 1,0

Medium speed: 0,85

Minimum speed: 0,76



Size 904			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Twl [°C]	Qw [l/h]	dPw [kPa]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]
40	1.000	6,7	13,2	24,5	10,0	28,4	8,3	30,4	7,3	31,6	6,6	32,3	6,0	33,1
	1.760	21,0	14,8	27,5	11,1	30,6	9,3	32,2	8,2	33,1	7,4	33,7	6,7	34,4
	3.400	78,3	16,0	29,6	12,0	32,2	10,0	33,5	8,8	34,3	8,0	34,8	7,2	35,3
45	1.000	6,7	15,0	27,8	11,7	31,6	10,0	33,6	9,0	34,7	8,4	35,5	7,7	36,3
	1.760	21,0	16,7	31,0	13,0	34,1	11,2	35,7	10,1	36,6	9,3	37,3	8,6	37,9
	3.400	78,3	18,0	33,4	14,0	36,0	12,0	37,3	10,8	38,0	10,0	38,5	9,2	39,1
50	1.000	6,7	16,7	31,0	13,4	34,8	11,7	36,7	10,7	37,9	10,0	38,6	9,4	39,4
	1.760	21,0	18,6	34,5	14,9	37,6	13,0	39,2	11,9	40,1	1,2	40,7	10,4	41,3
	3.400	78,3	20,0	37,1	16,0	39,7	14,0	41,0	12,8	41,8	12,0	42,3	11,2	42,8
60	1.220	10,0	21,2	39,3	17,7	42,8	15,9	44,5	14,9	45,6	14,2	46,3	13,5	47,0
	1.720	20,0	22,5	41,7	18,8	44,8	16,9	46,3	15,8	47,2	15,0	47,8	14,3	48,4
	2.720	50,1	23,7	44,0	19,8	46,7	17,8	48,0	16,6	48,8	15,8	49,3	15,0	49,9
70	1.230	10,2	24,9	46,2	21,4	49,6	19,6	51,3	18,5	52,4	17,8	53,1	17,1	53,7
	1.600	17,3	26,1	48,3	22,4	51,4	20,5	53,0	19,4	53,9	18,6	54,6	17,9	55,2
	2.230	33,7	27,2	50,4	23,3	53,2	21,4	54,7	20,2	55,5	19,5	56,1	18,7	56,6
80	850	4,9	26,4	48,9	23,1	52,8	21,5	54,8	20,5	56,0	19,8	56,7	19,2	57,5
	1.230	10,2	28,6	53,1	25,1	56,5	23,3	58,2	22,2	59,2	21,5	59,9	20,8	60,6
	1.990	26,8	30,8	57,1	27,0	60,0	25,1	61,4	23,9	62,3	23,1	62,9	22,4	63,4

Size 1003			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Twl [°C]	Qw [l/h]	dPw [kPa]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]
40	1.150	9,7	15,8	21,3	11,9	26,0	9,9	28,4	8,7	29,8	7,9	30,7	7,1	31,6
	2.080	32,0	17,9	24,1	13,4	28,1	11,2	30,1	9,9	31,3	9,0	32,1	8,1	32,9
	4.060	121,9	19,4	26,2	14,6	29,6	12,1	31,4	10,7	32,4	9,7	33,1	8,7	33,8
45	1.150	9,7	17,9	24,1	13,9	28,8	12,0	31,1	10,8	32,5	10,0	33,5	9,2	34,4
	2.080	32,0	20,2	27,3	15,7	31,2	13,5	33,2	12,2	34,4	11,3	35,2	10,4	36,0
	4.060	121,9	21,9	29,5	17,0	33,0	14,6	34,7	13,1	35,7	12,2	36,4	11,2	37,1
50	1.150	9,7	20,0	27,0	16,0	31,6	14,0	33,9	12,8	35,2	12,0	36,2	11,2	37,1
	2.080	32,0	22,5	30,3	18,0	34,3	15,8	36,2	14,4	37,4	13,5	38,2	12,6	39,0
	4.060	121,9	24,4	32,8	19,5	36,3	17,1	38,0	15,6	39,0	14,6	39,7	13,7	40,4
60	1.470	15,9	25,6	34,5	21,4	38,8	19,3	41,0	18,0	42,2	17,1	43,1	16,3	44,0
	2.090	32,3	27,3	36,8	22,8	40,7	20,5	42,6	19,1	43,8	18,2	44,6	17,3	45,3
	3.310	81,0	28,9	38,9	24,1	42,4	21,7	44,2	20,2	45,2	19,3	46,0	18,3	46,7
70	1.480	16,2	30,1	40,6	25,8	44,8	23,7	46,9	22,4	48,2	21,6	49,0	20,7	49,9
	1.940	27,8	31,6	42,6	27,1	46,5	24,9	48,5	23,5	49,7	22,6	50,5	21,7	51,2
	2.710	54,3	33,1	44,6	28,4	48,2	26,0	50,0	24,6	51,1	23,6	51,9	22,7	52,6
80	1.030	7,8	31,8	42,9	27,9	47,6	25,9	49,9	24,7	51,3	23,9	52,3	23,1	53,2
	1.490	16,4	34,7	46,7	30,4	50,9	28,2	53,0	26,9	54,3	26,0	55,1	25,2	55,9
	2.410	42,9	37,4	50,4	32,7	54,1	30,4	56,0	29,0	57,1	28,1	57,8	27,1	58,6

Size 1104			Tai 0°C		Tai 10°C		Tai 15°C		Tai 18°C		Tai 20°C		Tai 22°C	
Twl [°C]	Qw [l/h]	dPw [kPa]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]	Pt [kW]	Tau [°C]
40	1.500	10,3	20,3	23,2	15,3	27,4	12,8	29,6	11,2	30,8	10,2	31,7	9,2	32,5
	2.720	34,0	23,1	26,3	17,3	29,7	14,4	31,5	12,7	32,5	11,5	33,2	10,4	33,9
	5.290	128,6	25,0	28,5	18,7	31,4	15,6	32,8	13,7	33,7	12,5	34,3	11,3	34,8
45	1.500	10,3	23,0	26,3	18,0	30,5	15,4	32,6	13,9	33,8	12,9	34,7	11,8	35,5
	2.720	34,0	26,0	29,7	20,3	33,1	17,4	34,8	15,7	35,9	14,5	36,5	13,3	37,2
	5.290	128,6	28,2	32,1	21,9	35,0	18,8	36,4	16,9	37,3	15,7	37,9	14,4	38,4
50	1.500	10,3	25,7	29,4	20,6	33,5	18,0	35,6	16,5	36,8	15,5	37,6	14,4	38,4
	2.720	34,0	29,0	33,1	23,2	36,5	20,3	38,2	18,6	39,2	17,4	39,9	16,3	40,5
	5.290	128,6	31,3	35,7	25,1	38,6	22,0	40,0	20,1	40,9	18,8	41,5	17,6	42,0
60	1.890	16,4	32,9	37,6	27,5	41,4	24,8	43,2	23,1	44,4	22,0	45,1	20,9	45,9
	2.680	33,0	35,1	40,0	29,3	43,4	26,3	45,0	24,6	46,0	23,4	46,7	22,2	47,4
	4.260	83,4	37,1	42,4	30,9	45,3	27,9	46,8	26,0	47,7	24,8	48,2	23,5	48,8
70	1.910	16,7	38,8	44,2	33,2	47,9	30,5	49,8	28,8	50,9	27,7	51,6	26,6	52,4
	2.500	28,7	40,7	46,4	34,9	49,8	32,0	51,5	30,2	52,5	29,1	53,2	27,9	53,8
	3.490	55,9	42,5	48,5	36,5	51,6	33,4	53,1	31,6	54,1	30,4	54,7	29,2	55,3
80	1.320	8,0	40,9	46,6	35,8	50,9	33,3	53,0	31,8	54,2	30,7	55,1	29,7	55,9
	1.920	16,9	44,6	50,9	39,1	54,6	36,3	56,4	34,6	57,5	33,5	58,2	32,4	58,9
	3.100	44,1	48,1	54,9	42,1	58,0	39,1	59,6	37,3	60,6	36,1	61,2	34,9	61,8

Pt: heat output

Twl: water intake temperature

Tau: air outlet temperature

Data refer to rated conditions.

Tai: air intake temperature

Qw: flow rate of water at coil

dPw: pressure drop water side

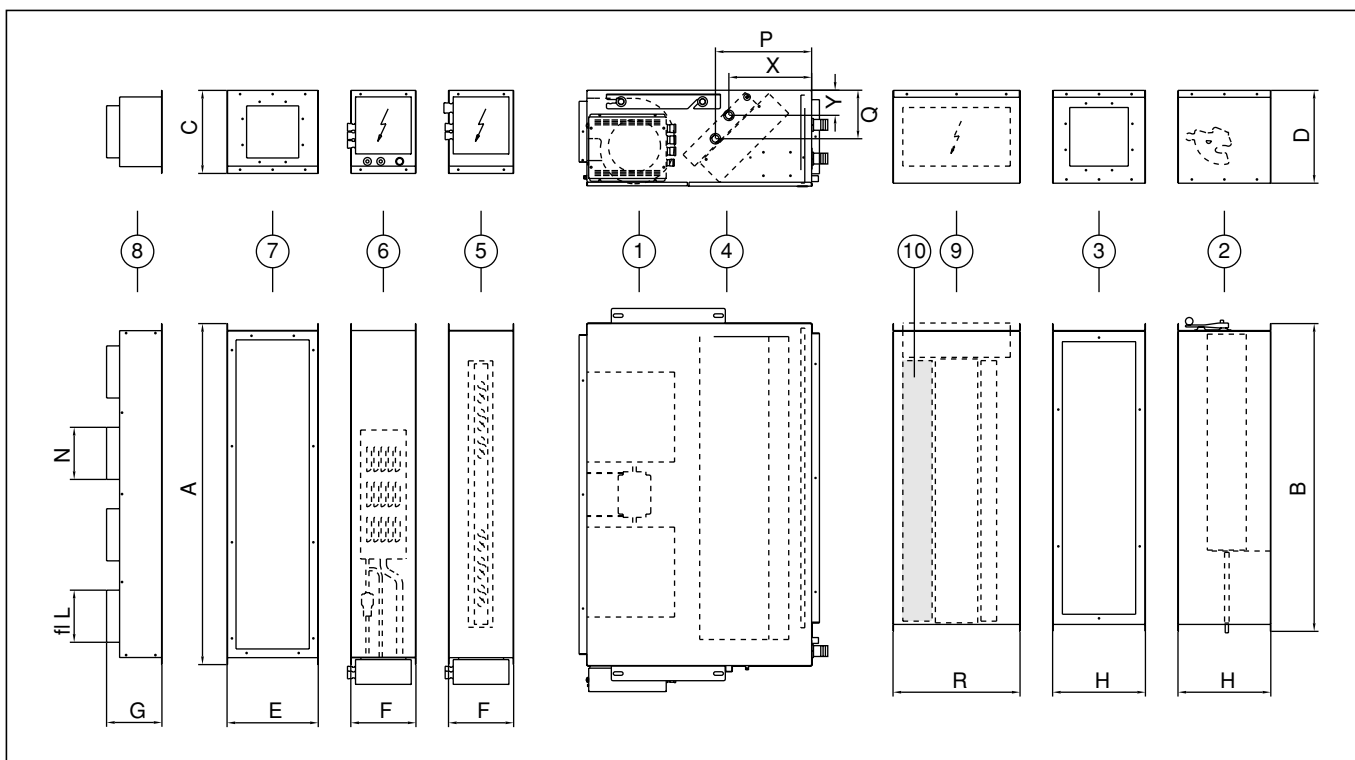
COOLING/HEATING CAPACITY CORRECTION FACTOR

Max speed: 1,0

Medium speed: 0,85

Minimum speed: 0,76

## LAYOUT OF ACCESSORIES



- |   |                                    |                                      |                            |
|---|------------------------------------|--------------------------------------|----------------------------|
| 1 ductable unit   | 3 intake plenum                    | 6 humidifier module                  | 9 air purification module  |
| 2 two way intake plenum with winter damper (fitted inside unit) | 4 auxiliary water coil for heating | 7 discharge plenum                   | 10 activated carbon filter |
|   | 5 electric heater module           | 8 discharge plenum for round ducting |                            |

Size	Dimensions														
	A	B	C	D	E	F	G	H	øL	N	X	P	Y	Q	R
602 - 703	820	820	255	255	280	200	170	285	160	4	254	295	77	149	350
803 - 904	1050	945	255	285	280	200	170	285	160	4	254	295	77	149	350
1003 - 1104	1050	1050	305	305	330	200	170	330	200	4	267	314	89	157	350

## INSTALLING ACCESSORIES

All modules are supplied ready for fixing to the discharge and intake flange of the basic unit, another module or directly to the ducting.

Always include the gasket supplied between one module and another.

## TWO WAY INTAKE PLENUM WITH DAMPER

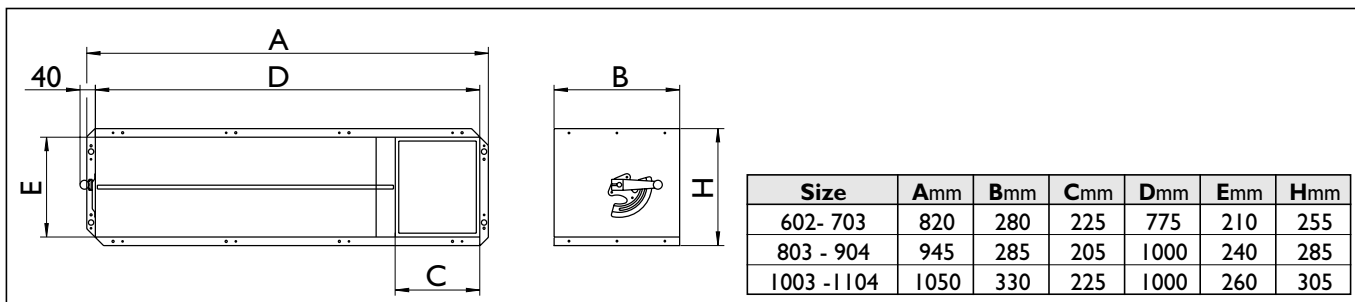
The two way intake plenum with damper enables the room air intake duct and the external air intake duct to be connected when required by the installation.

Regulation is via a manual damper that may be motorised

**Fit a grid protecting the impellers if accessories are not mounted.**

**Note: if the humidifier module is connected directly to the discharge, remove the lower part of the duct rim.**

following removal of the manual hand wheel (the motorised control is not provided). The cross section of the external air intake duct is 25% the total cross section.

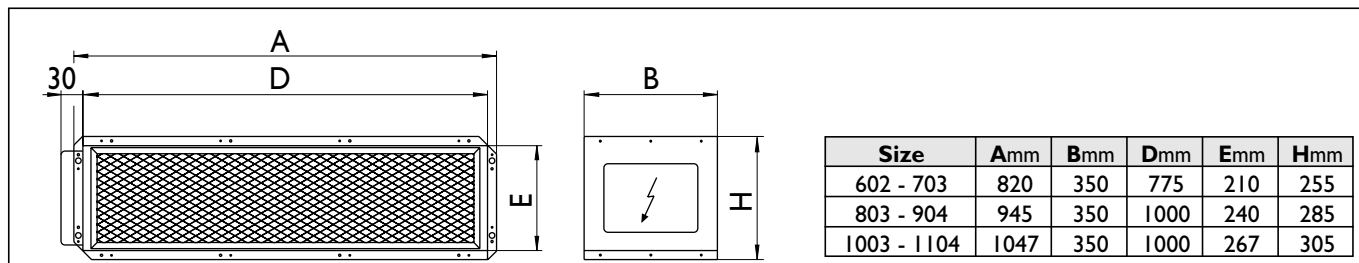


## AIR PURIFICATION MODULE

The air purification model effectively controls all the main causes of pollution, making the air healthier. The module consists of:

- a pre-filter to eliminate the largest particles;;
- an electrostatic filter to remove the remaining impurities suspended in the air;

- an activated carbon filter (optional), which can be inserted in the module;
- the module is powered and controlled directly from the electronic board and functions only when the fan is on for the HWDE, and independent from yet slave to the operation of the fan for the HWD.

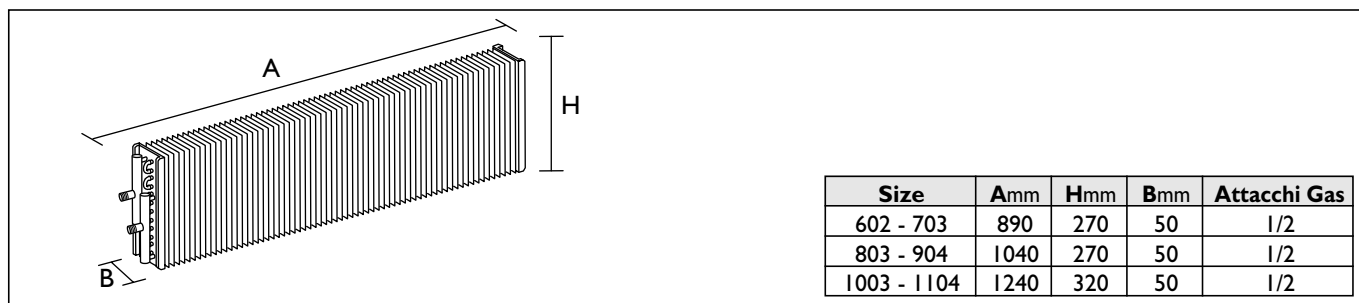


## AUXILIARY WATER COIL

The water coil module for winter heating is used in combination with a boiler. The module can be mounted using either right hand or left hand connections. The coil is fitted with special valves for venting the air or draining the water in the coil when not in use or to prevent freezing. The water coil module may be fitted with an ON/OFF or modulating regulating valve for the HWDE and ON/OFF only for the HWD.

The valve is controlled directly by the electronic board with a 0-10V signal for the HWDE, or directly by the PTH2 room thermostat for the HWD.

The BT3 sensor supplied as standard in the module acts as a minimum thermostat. It must be connected according to the diagrams on pages 12-13 and placed in the special sensor holder, only for the HWDE.

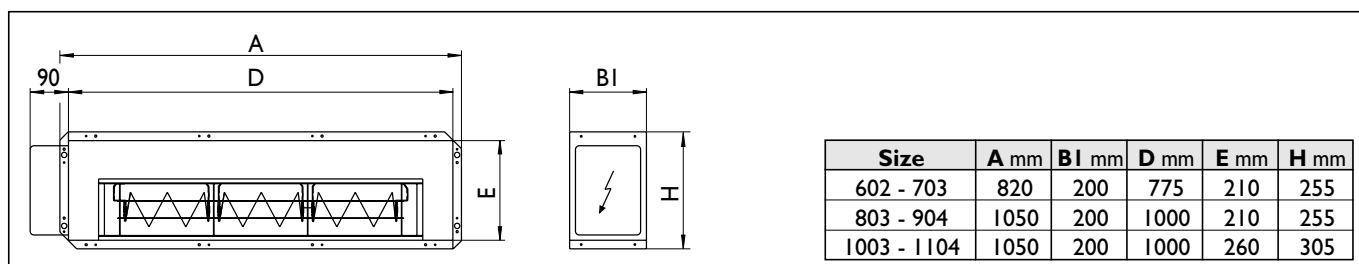


## ELECTRIC HEATER MODULE

The electric heater module is supplied for winter heating as an alternative to the auxiliary hot water coil.

The maximum outputs available with 230V~50 are 3.0 kW for sizes 602-703-803-904, and 4.5 kW for sizes 1003-1104. The outputs available with 400V-3+N~50 are 3.0 kW for sizes 602-703-803-904 and 4.5 kW for sizes 1003-1104.

The module must be installed downstream of the basic unit directly in the outflow of air. The stainless steel spiral heaters are mounted on a removable frame independent from the module. The heaters feature ON-OFF operation.



**Note:** For correct operation of the heaters, air flow should not drop below the values for minimum speed.

## HUMIDIFIER MODULE

The humidifier module increases air humidity by emitting water vapour into the atmosphere. It consists of a stainless steel water pan with power and control switchboard, electric heater with safety thermostat, level sensor, solenoid valve, water filling assembly, overflow pipe and seasonal drain valve.

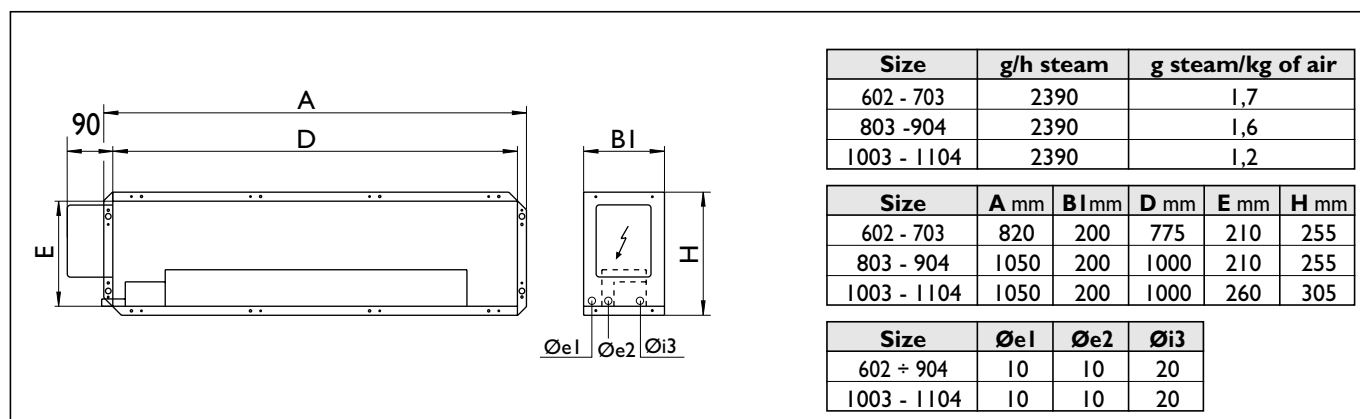
If used with particularly hard water, a water softener should be used.

The quantity of steam produced at maximum speed with an installed electrical power of 1,500 W depends on the model (see table below). The humidifier module should be installed downstream of the basic unit (and always downstream of the electric heater module).

The humidifier module includes a humidistat to control the humidity of the room.

The humidifier module also incorporates a 10 mm ext. diam. copper connection (1) for filling the pan with water complete with cock and solenoid valve, a 10 mm ext. diam. copper connection (2) for seasonal draining of the pan complete with cock and a 20 mm int. diam. rubber connection (3) for the overflow pipe.

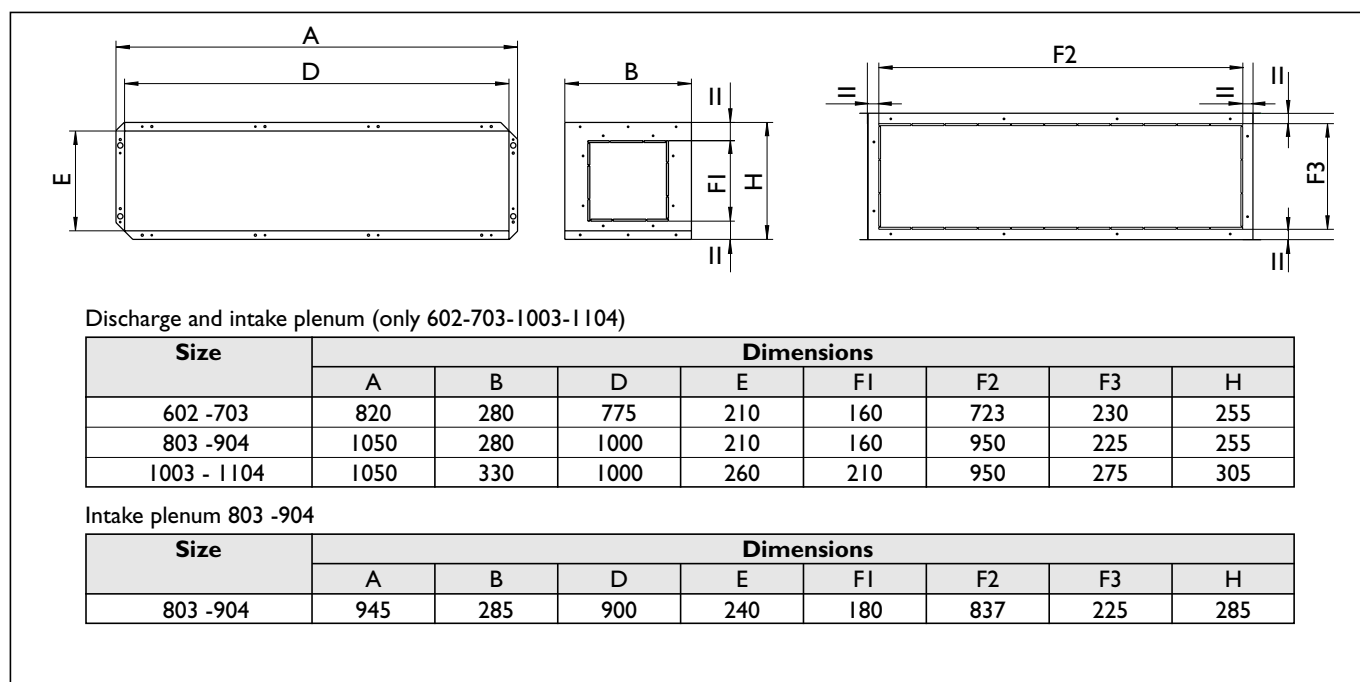
To guarantee full efficiency of the overflow pipe, the feed pressure should not exceed 2 bars and the pipe should have a minimum internal diameter of 20 mm.



## DISCHARGE (AND INTAKE) PLENUM

The discharge and intake plenum is supplied when the incoming or outgoing air flow must be directed to or from the bottom of the unit.

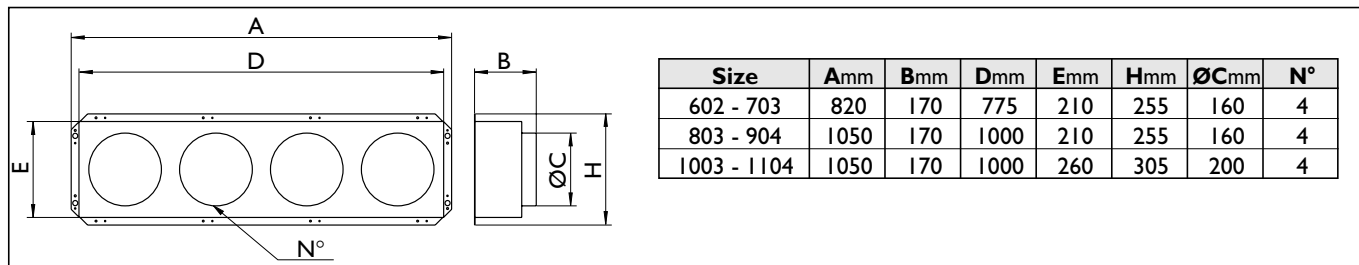
It has a flange for connection to the basic unit or other accessories and blanked panels for optimum and flexible use.



## DISCHARGE PLENUM FOR ROUND DUCTING

The discharge plenum for round ducting enables the air to be distributed through flexible ducts. Distribution takes place through four 160 mm diam. ducts in sizes 602-703-803-904 and four 200 mm diam. ducts in sizes 1003-1104.

The number of ducts is calculated so as to obtain an air speed of 5.0 m/s in the ducts with rated air flow and the ducts fully open.



## WEIGHT OF ACCESSORIES

Module	Size	Gross weight kg	Net weight kg
Two way intake plenum with damper	602-703 / 803-904	10,7/13	8,7/11
	1003-1104	15	12
Air purifier	602-703 / 803-904	15 / 20	13,3 / 17,3
	1003-1104	23,5	20,5
Auxiliary water coil	602-703 / 803-904	3,7/4,5	3,0/3,8
	1003-1104	5,5	4,8
Electric heater	602-703 / 803-904	9,5/11	7,5/9
	1003-1104	12	9,5
humidifier	602-703 / 803-904	10,8/13	8,6/10,8
	1003-1104	13,5	11
Intake/discharge plenum (only 1003-1104)	602-703 / 803-904	8,4/10	6,2/7,8
	1003-1104	11,5	9
Intake plenum	803-904	10	7,8
Discharge plenum for round ducting	602-703 / 803-904	5,7/6,5	3,5/4,3
	1003-1104	7	4,7

Size 602-703			Tai: -5°C		Tai: 0°C		Tai: 10°C		Tai: 15°C		Tai: 20°C		Tai: 22°C			
Twi	Q	ΔPw	Pt		Tau		Pt		Tau		Pt		Tau		Pt	
°C	l/h	kPa	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
60	470	5,6	9,3	17,2	8,7	20,1	7,4	27,7	6,8	31,6	6,2	34,8	5,9	36,1		
	600	9,1	9,6	18,0	8,9	21,3	7,7	28,4	7,0	31,7	6,4	35,3	6,1	36,6		
	770	15	10,0	18,9	9,4	22,5	8,0	29,1	7,4	32,7	6,7	36,0	6,4	37,3		
70	470	5,6	12,1	23,9	11,3	27,0	9,7	33,2	8,9	36,3	8,1	39,4	7,8	40,7		
	600	9,1	13,0	26,1	12,2	29,2	10,5	35,1	9,6	38,0	8,70	40,8	8,3	41,8		
	770	15	13,7	27,8	12,7	30,4	10,9	36,1	10,0	38,9	9,10	41,8	8,7	42,8		
80	470	5,6	14,4	29,4	13,4	32,0	11,5	37,5	10,6	40,3	9,6	43,0	9,2	44,0		
	600	9,1	15,6	32,3	14,6	34,9	12,5	39,9	11,4	42,3	10,4	44,9	9,9	45,7		
	770	15	46,8	35,2	15,7	37,5	13,5	42,3	12,3	44,4	11,2	46,8	10,7	47,6		

Size 803-904			Tai: -5°C		Tai: 0°C		Tai: 10°C		Tai: 15°C		Tai: 20°C		Tai: 22°C			
Twi	Q	ΔPw	Pt		Tau		Pt		Tau		Pt		Tau		Pt	
°C	l/h	kPa	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
60	55,0	8	12,0	16,5	11,2	20,1	9,6	27,2	8,8	30,8	8,0	34,3	7,7	35,8		
	750	14	12,9	18,1	12,0	21,5	10,3	28,5	9,5	32,0	8,6	35,4	8,3	36,9		
	1015	26	13,6	18,4	12,8	23,0	10,9	29,5	10,0	32,9	9,1	35,8	8,8	37,8		
70	550	8	14,9	21,7	13,8	24,7	11,9	31,3	10,9	34,5	9,9	37,2	9,5	39,0		
	750	14	16,2	24,1	15,1	27,1	13,0	33,3	11,9	36,3	10,8	39,4	10,4	40,7		
	1015	26	17,7	26,7	16,5	29,6	14,2	35,5	13,0	38,3	11,8	41,0	11,3	42,3		
80	550	8	18,4	28,0	17,2	30,8	14,8	36,5	13,5	39,2	12,3	42,1	11,7	43,0		
	750	14	19,5	30,0	18,2	32,6	15,6	38,8	14,3	40,6	13,0	43,3	12,5	44,0		
	1015	26	22,0	34,5	20,6	36,9	17,6	41,6	16,2	44,1	14,7	46,4	14,1	47,3		

Size 1003			Tai: -5°C		Tai: 0°C		Tai: 10°C		Tai: 15°C		Tai: 20°C		Tai: 22°C			
Twi	Q	ΔPw	Pt		Tau		Pt		Tau		Pt		Tau		Pt	
°C	l/h	kPa	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
60	890	10	19,2	21,5	17,8	24,2	15,1	30,3	13,5	33,4	12,1	36,4	11,5	37,6		
	1110	16	20,0	22,1	18,5	25,2	15,6	31,2	14,1	34,1	12,6	37,1	11,9	38,2		
	1440	26	20,7	23,1	19,2	26,1	16,1	31,9	14,6	34,8	13,0	37,7	12,4	38,8		
70	890	10	22,3	25,3	20,8	28,4	18,0	34,5	16,6	37,6	15,2	40,6	14,6	41,8		
	1110	16	23,1	26,4	21,7	29,5	18,7	35,5	17,3	38,4	15,8	41,4	15,1	42,6		
	1440	26	23,9	27,5	22,4	30,5	19,4	36,4	17,9	39,3	16,7	42,2	15,7	43,3		
80	890	10	25,3	29,4	23,9	32,5	21,1	38,7	19,7	41,7	18,3	44,8	17,7	46,0		
	1110	16	26,3	30,7	24,8	33,8	21,9	39,8	20,4	42,8	19,0	45,7	18,4	46,9		
	1440	26	27,2	31,9	25,7	34,9	22,7	40,8	21,2	43,7	19,6	46,6	19,0	47,8		

Size 1104			Tai: -5°C		Tai: 0°C		Tai: 10°C		Tai: 15°C		Tai: 20°C		Tai: 22°C			
Twi	Q	ΔPw	Pt		Tau		Pt		Tau		Pt		Tau		Pt	
°C	l/h	kPa	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C	kW	°C
60	960	12	20,7	19,7	19,4	22,9	16,1	29,3	14,6	32,4	13,0	35,5	12,4	36,8		
	1195	18	21,5	20,7	19,9	23,8	16,8	30,0	15,1	33,1	13,6	36,2	12,9	37,4		
	1540	30	22,2	21,6	20,5	24,5	17,4	30,8	15,7	33,8	14,1	36,8	13,4	37,9		
70	960	12	24,0	23,7	22,5	26,9	19,4	33,2	17,9	36,4	16,3	39,5	15,7	40,8		
	1195	18	24,9	24,8	23,3	27,9	20,2	34,1	18,6	37,2	17,0	40,0	16,3	41,5		
	1540	30	25,8	25,8	24,2	28,9	20,9	35,0	19,2	38,0	18,0	41,1	16,9	42,2		
80	960	12	27,2	27,6	25,8	30,8	22,7	37,2	21,2	40,3	19,7	43,5	19,0	44,7		
	1195	18	28,3	28,8	26,7	32,0	23,6	38,2	22,0	41,3	20,4	44,4	19,8	45,6		
	1540	30	29,3	30,0	27,7	33,1	24,4	39,2	22,8	42,2	21,2	45,3	20,5	46,4		

Twi: water intake temperature

Q: water flow-rate

ΔPw: pressure drop water side

Pt: heat output

Tau: air outflow temperature

Tai: air intake temperature



The area enclosed by the dotted line refers to industrial type operating conditions.



Data refer to rated conditions.

**PRESSURE DROP AIR SIDE AUXILIARY COIL**

Size	Q air m³/h	1100	1200	1300	1400	1500	1600
602-703	Δpa (Pa)	12	14	17	19	22	26
Size	Q air m³/h	1200	1300	1400	1500	1600	1700
803-904	Δpa (Pa)	10	12	14	17	19	22
Size	Q air m³/h	1800	1900	2000	2100	2200	2300
1003	Δpa (Pa)	10	12	13	14	16	19
Size	Q air m³/h	2200	2300	2400	2500	2600	2800
1104	Δpa (Pa)	16	17	19	20	22	26

**PRESSURE DROP AIR SIDE TWO WAY INTAKE MODULE**

Size	Q air m³/h	1100	1200	1300	1400	1600	1800	2000	2200	2400	2500	2800
602-703	Δpa (Pa)	10,5	13,0	15,0	17,5	22,5	28,0	-	-	-	-	-
803-904	Δpa (Pa)	-	4,0	5,5	7,5	10,0	12,5	-	-	-	-	-
1003	Δpa (Pa)	-	-	-	-	6,0	7,5	9,5	11,5	14,0	-	-
1104	Δpa (Pa)	-	-	-	-	-	7,5	9,5	11,5	14,0	15,0	19,0

Note: Damper in 45° position

**PRESSURE DROP AIR SIDE DISCHARGE PLENUM FOR ROUND DUCTING**

Size	Q air m³/h	1100	1200	1300	1400	1600	1800	2000	2200	2400	2500	2800
602-703	Δpa (Pa)	11,5	13,5	16,0	18,5	24,0	30,5	-	-	-	-	-
803-904	Δpa (Pa)	-	9,5	13,5	18,0	24,0	30,0	-	-	-	-	-
1003	Δpa (Pa)	-	-	-	11,0	14,0	18,0	22,0	26,0	31,0	-	-
1104	Δpa (Pa)	-	-	-	-	-	18,0	22,0	26,0	31,0	34,0	43,0

Note: Ducts fully open

**PRESSURE DROP AIR SIDE ELECTRIC RESISTOR MODULE**

Size	Q air m³/h	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
602-703	Δpa (Pa)	3,5	4,0	5,0	6,0	7,0	8,0	9,3	10,5	12,0	13,4
Size	Q air m³/h	1200	1300	1400	1600	1800	2000	2200	2400	2500	2800
803-904	Δpa (Pa)	2,0	3,0	4,0	5,0	6,0	-	-	-	-	-
1003	Δpa (Pa)	-	-	3,0	3,5	4,5	5,5	7,0	8,0	-	-
1104	Δpa (Pa)	-	-	-	3,5	4,5	5,5	7,0	8,0	9,0	11,5

**OPERATING LIMITS**

<b>Cooling (°C)</b>	Max. water intake temperature	16,5
	Min. water intake temperature	1 (3)
<b>Heating (°C) main coil</b>	Max. water intake temperature	80 (1)
	Min. water intake temperature	30
<b>Heating (°C) auxiliary coil</b>	Max. water intake temperature	80 (1)
	Min. water intake temperature	30
<b>Hydraulic circuit pressure min-max (bar)</b>		1÷3 (2)
<b>Max. storage temperature (°C)</b>		63

(1) With room temperature of +22°C

(2) For humidifier module, max. pressure = 2 bars

(3) Minimum working temperature depends on the thermal carrier used.

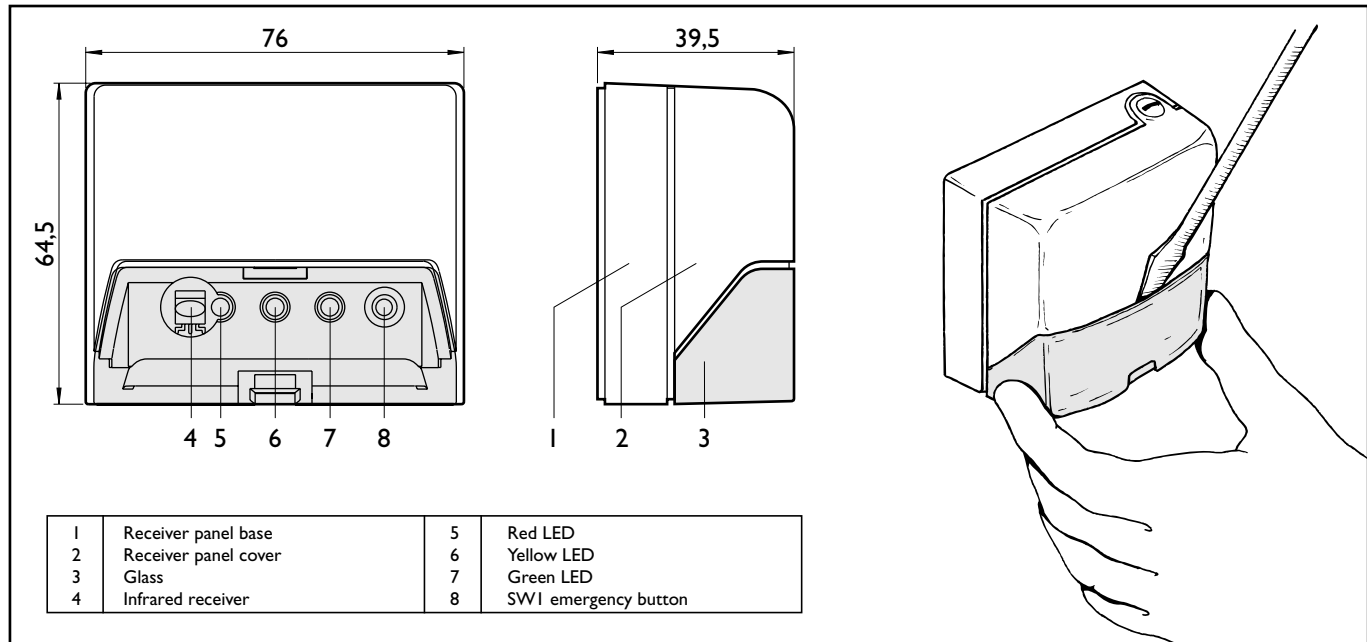
If operation of the unit has to be guaranteed with water temperatures of less than 1°C or stopping of the unit at room temperatures of less than 1°C, ethylene glycol must be added to the fluid in the hydraulic circuit in sufficient quantities to avoid freezing.

The receiver panel dialogues with the main unit board, communicating the operating modes received from the infrared remote control unit.

It thus acts as receiver, machine status indicator through the three LEDs present and, via the SWI button, emergency panel should the remote control unit be unusable.

To interpret the LED messages, see page 33.

For access to the SWI button (8), remove the protective glass by levering the tab with an implement and at the same time lifting it as shown in the figure.



## ACCESS TO THE POWER TERMINAL BOARD AND FIXING HOLES

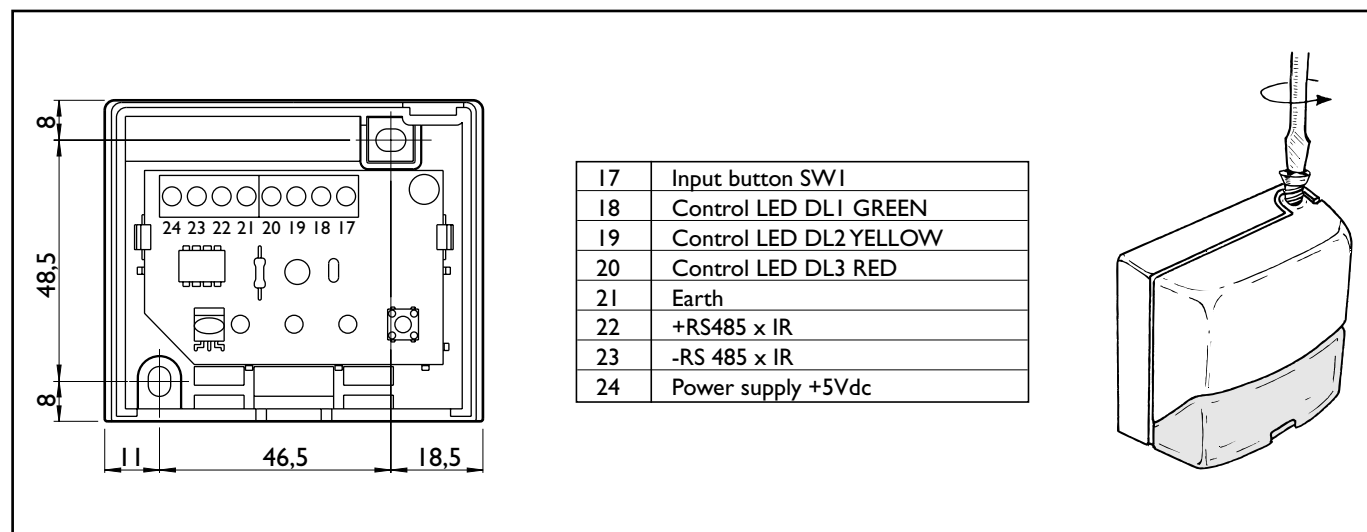
This operation should be carried out only when there is no power to the unit.

To access the power terminal board, remove the cover of the receiver panel without removing the protective glass.

To remove the cover, undo the fixing screws, lift the cover

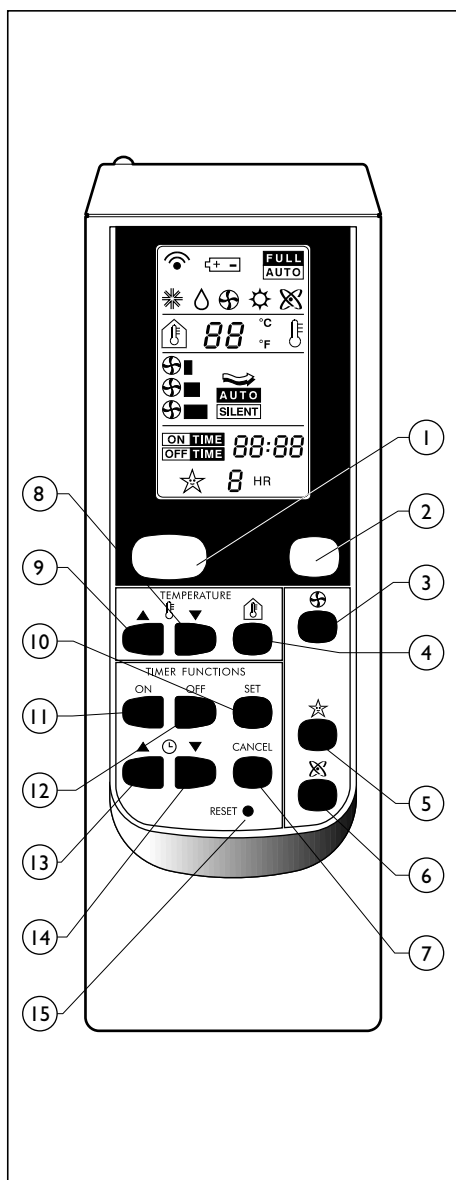
and detach it from the base of the receiver panel as shown in the figure.

To fix to the wall, use the anchor screws provided.

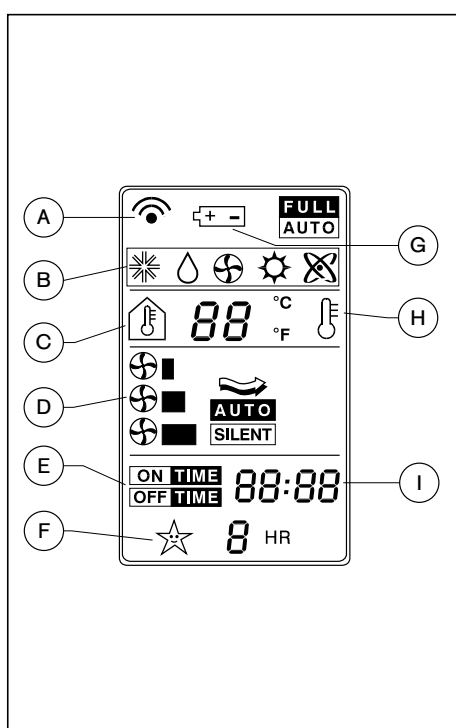


**Note:** when cabling or fixing to the wall, take care not to damage the receiver board.





- 1 ON/OFF button**  
- When on, the operating mode is displayed;  
- When off, the clock is displayed.
- 2 Mode button**  
Selects the various operating modes:  
Cool, Heat, Fan, Dry, Full Auto.
- 3 Fan button**  
When not in Full Auto or Sleep mode, five different fan speeds can be selected: minimum, medium, maximum, automatic and silent.
- 4 Room temperature button**  
Displays room temperature for five seconds
- 5 Sleep button**  
Activates or deactivates the sleep function with “silent” fan speed (the Sleep function can be set for a maximum duration of seven hours)
- 6 Ionising button**  
If enabled, activates or deactivates the air purification mode.
- 7 Cancel button**  
Deactivates the timer (On/Off) function previously selected.
- 8/9 Temperature Up/Down buttons**  
Changes the temperature set point of the mode displayed.
- 10 Set button**  
Activates the timer (On/Off) function
- 11/12 Timer On/Off buttons**  
Sets the automatic on/off function (On/Off)
- 13/14 Times Up/Down buttons**  
Modifies the timer or clock setting.
- 15 Reset button (protected access)**  
Cancels all settings and resets to default values



### THE DISPLAY

When the air conditioner is turned on, all symbols are displayed. When it is turned off, only the clock remains.

- A Transmission:** displays the successful transmission of an instruction to the reception panel which confirms it with three short flashes of the LEDs in succession.
- B Function symbols:** conditioning, dehumidifying, ventilation, heating, Full Auto and ionising.
- C Room temperature:** displays room temperature.
- D Fan speed:** displays the various speeds: minimum, medium, maximum, automatic and silent.
- E Timer on/off:** displays the on/off times programmed.
- F Sleep function button:** displays the night function and the programmed time.
- G Replace coils indication.**
- H Temperature set:** displays the temperature set.
- I Clock:** displays the clock.

The logic for the various operating modes is as follows:

## Cooling with valve

According to room temperature, commands opening of the main coil four-way valve and according to the temperature of the coil (cool start), starting up of the fan.

The valve command is given directly by the electronic board with a 0-10V signal coming from terminals 37 and 38, either ON-OFF (DIP SWITCH 2 ON) or proportional (DIP SWITCH 2 OFF). Fan speed can be selected from automatic or the four manual speeds.

Heating with valve (standard unit)

According to room temperature, commands opening of the main coil four-way valve and according to the temperature of the coil (hot start), starting up of the fan. The valve command is given directly by the electronic board with a 0-10V signal coming from terminals 37 and 38, either ON-OFF (DIP SWITCH 2 ON) or proportional (DIP SWITCH 2 OFF). Fan speed can be selected from automatic or the four manual speeds.

## Heating with electric heater kit

According to room temperature and the temperature of the main coil four-way valve, commands starting up of the fan and three-step starting up of the electric heater.

The heater command is given directly by the electronic board with a proportional 0-10V signal coming from terminals 15 and 16 (DIP SWITCH 2 OFF).

The heater functions only when the fan is in operation and the main coil temperature is less than 40°C.

There are two types of overheating protection device incorporated in the module itself. The first with automatic reset cuts in when the temperature of the electric heater is above 100°C. The second with manual reset cuts in when the temperature of the electric heater is above 115°C.

To RESET, turn power off then on again. The four manual fan speeds or automatic can be selected.

## Heating with auxiliary water coil kit

According to room temperature, commands opening of the auxiliary coil valve and according to the temperature of the coil (hot start), starting up of the fan. The valve command is given directly by the electronic board with a 0-10V signal coming from terminals 15 and 16, either ON-OFF (DIP SWITCH 2 ON) or proportional (DIP SWITCH 2 OFF).

The four manual fan speeds or automatic can be selected.

## Fan

In this mode, only the fan operates at one of the four manual speeds set by the remote control unit.

## Full auto

In this mode the unit operates in automatic. The micro-processor analyses room temperature and, according to a precise algorithm, selects from the modes available the most appropriate function to achieve comfortable conditions.

## Timer

This mode allows programmed start up and shut down of the unit over a 24 hour period.

## Sleep

This mode is used during the night. It enables the room to be maintained at optimum temperature with silent operation, avoiding excessive temperature changes. The turning off time is programmed by selecting the number of operating hours.

## Humidification

This mode functions only when the humidifier module is present. It is controlled by the electronic thermostat and room humidistat supplied as standard.

It is controlled from the main electronic board, ensuring that the module functions only during heating mode and with the fan operating.

The safety devices on the humidifier consist of a float and a safety thermostat for the electric heater.

If the water level is constant for more than three minutes with the humidifier on or the pan reaches a temperature of 85°C, the humidifier is turned off automatically and an alarm signal is generated between terminals 3 and 4 on the module board. To reset, turn the power off and then on again.

## Important:

- the use of the unit without valves and with the fan wired as in the diagram on page 13 disables the COOL-START function in summer operation, the HOT START function in winter operation, both with the main coil and the auxiliary water coil, and the entire "fan" function.
- in cooling and heating mode with both the main coil and the auxiliary coil with electric heater, when the thermostat reaches the temperature set, the fan comes on at SILENT speed for 60 seconds every seven minutes. This is to sensitise the room sensor which is normally located inside the intake duct.

**Note:** to configure the unit, see the DIP-SWITCH table on page 8.

## DISPLAYING OPERATING MODES

MODE	THERMOSTAT SATISFIED	DL1 (green)	DL2 (yellow)	DL3 (red)
OFF(1)	-	OFF	OFF	OFF
COOL	-	<b>ON</b>	OFF	OFF
HEAT	-	OFF	OFF	<b>ON</b>
DRY	-	<b>ON</b>	OFF	<b>ON</b>
COOL	SI	<b>ON</b>	OFF	OFF
COOL	NO	<b>ON</b>	<b>ON</b>	OFF
HEAT	SI	OFF	OFF	<b>ON</b>
HEAT	NO	OFF	<b>ON</b>	<b>ON</b>
DRY	SI	<b>ON</b>	OFF	<b>ON</b>
DRY	NO	<b>ON</b>	OFF	<b>ON</b>
FULL AUTO (2)	-	(*)	(*)	(*)
FAN	-	OFF	<b>ON</b>	OFF
FILTERS EXHAUSTED (3)	-	-	<b>BLINK</b>	-
ALARM (4)	-	<b>BLINK</b>	<b>BLINK</b>	<b>BLINK</b>

There are three LEDs on the receiver panel (1 red, 1 green, 1 yellow) and they provide a general picture of the unit status (see above table).

- (1) If one of the TIMER functions is active, the LEDs all remain on without flashing.
- (2) As soon as the “operating mode” is selected, all LEDs go off for a number of seconds while the controller decides which operating mode to use (heating, cooling, dehumidification, ventilation).

- (3) When the filter is dirty (1,450 hours of operation), the yellow LED flashes.

To reset, clean the filter and hold the SWI button on the receiver panel down for at least seven seconds. The reset is displayed by a double flash of the three LEDs.

- (4) The alarms displayed by this flashing are: sensor malfunction, external alarm, condensate alarm and valve malfunction. The display procedure is described on page 35.



## OPERATING MODES HWD

To operate correctly, the HWD terminal must be combined with a room thermostat with summer/winter and fan speed selector functions located in the room being air conditioned.

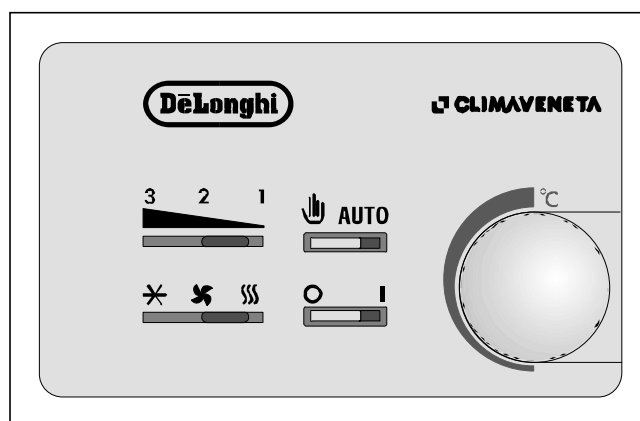
These functions are performed by the PTH2 accessory.

Once summer or winter mode has been selected, operation of the unit at the speed selected is controlled exclusively by the room thermostat.

## Description of the PTH2 electromechanical control unit

The PTH2 control unit acts as:

1. fan speed selector to select a fan speed from minimum, medium and maximum. The set value of maximum speed only can be modified using the potentiometer on the unit's electronic board
2. summer/winter/fan selector
3. room thermostat
4. ON/OFF switch
5. automatic/manual selector



**PRELIMINARY CHECKS**

- Check the internal unit is correctly positioned and that electrical and hydraulic connections are correct;
- check that the voltage and frequency are equal to 230V  $\pm 10\%$ ;
- check that the screws fastening the conductors to the electrical components have not worked loose;
- check the condensate drain connection;
- check that the outlet is ducted;
- check there is no air in the hydraulic circuit;
- check the hydraulic circuit for tightness.

**STARTING UP**

- Start up the unit in the required mode: cooling only or heating;
- check that the unit is configured in the correct mode;
- start up the unit using the remote control device. Check all functions;
- check that the absorption of the fan is below the peak current indicated in the table on page 16;
- check correct fan speed calibration in relation to the requirements of the system.

**FAN CALIBRATION MODE HWDE**

Each model of unit is supplied with the fan performance characteristics, maximum, medium and minimum speed as shown in the respective diagrams of each unit for the curves A, B or C (see page 17-18).

If these characteristics need to be improved to counteract additional pressure drop and maintain nominal air flow constant, an additional safety margin is available. This is shown in curve D. Through the board, the voltage to the fan can be increased to obtain the required performance. The field of voltage between curve A and curve D is divided into seven equal parts as represented in the various diagrams.

After identifying the curves corresponding to the pressure drop to be overcome (see accessories, duct couplings etc), proceed as follows:

1. To access the unit control board, turn the appliance off via the remote control unit and remove the switchboard cover (see page 8)

2. Access the CALIBRATION mode on the control board by setting DIP SWITCH 3 in the "ON" position. The fan is at the maximum pre-set speed.
3. Remove the glass protection from the receiver panel to access the emergency button SW1 (no. 8 page 30).
4. Push the switch the number of times corresponding to the curves chosen. The action is sequential. Once the maximum is reached (seven steps), it returns to the initial voltage. Each curves has a configuration of lit LEDs (see table).
5. Place DIP-SWITCH 3 in the OFF position.
6. Replace the electrical switchboard cover.
7. Replace the glass on the receiver panel. Once maximum speed has been varied, medium and minimum speeds are automatically modified.

The sequence of LEDs lighting up on the receiver panel as fan speed is varied during calibration is given below.

Max speed	(DL1) LED Green	(DL2) Yellow LED	(DL3) Red LED
Curve A	OFF	OFF	OFF
Curve 1	<b>ON</b>	OFF	OFF
Curve 2	OFF	<b>ON</b>	OFF
Curve 3	<b>ON</b>	<b>ON</b>	OFF
Curve 4	OFF	OFF	<b>ON</b>
Curve 5	<b>ON</b>	OFF	<b>ON</b>
Curve 6	OFF	<b>ON</b>	<b>ON</b>
Curve D	<b>ON</b>	<b>ON</b>	<b>ON</b>

Each model of unit is supplied with the fan performance characteristics, maximum, medium and minimum speed as shown in the respective diagrams of each unit for the curves A, B or C (see page 17-18).

If these characteristics need to be improved to counteract additional pressure drop and maintain nominal air flow constant, an additional safety margin is available. This is shown in curve D.

Maximum flow can be increased by using the trimmer RPI on the control board inside the switchboard.

Access the board by removing the switchboard cover. Increasing maximum speed (by rotating trimmer RPI anti-clockwise) automatically increases the medium and minimum speed by the same amount.

Reducing maximum speed (by rotating the trimmer RPI clockwise) reduces the difference between maximum and medium speeds and minimum speed.

For convenience, the difference between the maximum

speed set (curve A) and the maximum speed available (curve D) has been divided into seven equal parts as represented in the respective diagrams.

The voltage increase corresponding to each curve is given by the formula:

$$VI = \frac{(230V - V)}{7}$$

VI = voltage increase

V = voltage at max set speed (see table)

Identifying the curve corresponding to the pressure drop to be overcome also gives the voltage for calibrating maximum speed using trimmer RPI: [voltage at maximum speed + (VI x no. curve)]. Always verify the voltage at the fan after every new calibration.

The calibration voltages for the various speeds for each model are given below:

Model HWD	602	703	804	904	1003	1104
Voltage at minimum speed (V)	110	110	110	110	110	120
Voltage at medium speed (V)	120	120	140	140	135	140
Voltage at maximum speed (V)	140	140	187	187	155	180

#### Note:

The adjustment obtained using the above method is adequate but not precise.

It is therefore good practice to check the actual air flow by measuring the air speed in the duct.

The alarm display enables the user to identify the cause of the unit malfunction. To display the alarms, hold the SW1 button on the receiver down for four seconds. After the four sec-

onds, the board causes the three LEDs on the receiver to flash rapidly. When the button is released, the LEDs indicate the type of malfunction as in the table below.

Alarm	(DL1) Led Green	(DL2) Led Yellow	(DL3) Led Red
None	OFF	OFF	OFF
BT1 malfunction	OFF	OFF	<b>ON</b>
BT2 malfunction	OFF	<b>ON</b>	OFF
Valve malfunction	OFF	<b>ON</b>	<b>ON</b>
Drain pump shut down	<b>ON</b>	OFF	<b>ON</b>
Generic alarm	<b>ON</b>	<b>ON</b>	OFF
Humidifier shut down	<b>ON</b>	<b>ON</b>	<b>ON</b>

If more than one alarm is present, the priority alarm will be displayed from a BT1 malfunction to a generic alarm. The alarm display is cancelled in one of the following ways: by pressing the SW1 button, following receipt of a command from the remote control device, by turning the power to the board off or by TIME OUT after three minutes. Exiting from the alarm display resets normal operation of the LEDs.

**Note 1:** when the alarm signal appears in normal operation, the alarm display can be used without having to change the operating mode or turn the unit off.

**Note 2:** after displaying the alarm, contact the service centre.

## Unit test function reserved for installer

This function provides access to the various devices for a rapid diagnosis of their functionality.

Access sequence: The unit must be turned OFF with the fan stationary. Place DIP SWITCH 4 in the ON position. When power to the unit is turned on, it will be in test mode. Press button SW1 to move on to Step A.

### Step A

This step checks the functioning of the analogue inputs:

BT1 malfunction ⇒ DLI flashes otherwise DLI on;

BT2 malfunction ⇒ DL2 flashes otherwise DL2 on;

Press button SW1 to move on to Step B.

### Step B

This step checks the functioning of the digital inputs:

F1 closed (pump malfunction) ⇒ DL3 on otherwise DL3 flashes;

F4 closed (humidifier malfunction) ⇒ DLI+DL3 on otherwise DLI-DL3 flash;

Press button SW1 to move on to Step C.

### Step C

From this step onwards, each time button SW1 is pressed, all the outputs are activated in sequence in the following order:

- minimum fan speed;
- medium fan speed;
- maximum fan speed;
- RL1 presence of 230V cooling output;
- RL2 presence of 230V heating output;
- A3 presence of 230V humidifier output;
- A4 presence of 230V air purifier output;
- SA2 and SA3 presence of 5V four-way valve output (YV1-YV2).

the next two times the test button is pressed, all resources are deactivated and the control unit is turned OFF. Press SW1 again to repeat all the steps.

**Note:** in TEST mode, the remote control is deactivated.

To exit the TEST mode, set DIP SWITCH 4 in the OFF position. The unit will then be off.

# POWER FAILURE HWDE

# U I A

After a power failure, the board will resume operation in the mode in which it was functioning before the power cut, with the exception of FULL AUTO mode where the control unit will determine the operating mode according to

the conditions existing when power returns.

Current timings will be reset. If the TIMER or SLEEP functions were active, they will be deactivated.

# ROUTINE MAINTENANCE

# U I A

## IMPORTANT:

- Power to the unit must be disconnected before carrying out maintenance or cleaning.
- At the beginning of the season you are recommended to contact qualified personnel for the seasonal start-up.

To guarantee efficient long term operation of the unit, a number of essential and simple operations and checks should be carried out. These do not require the intervention of qualified personnel, but can be carried out by the user.

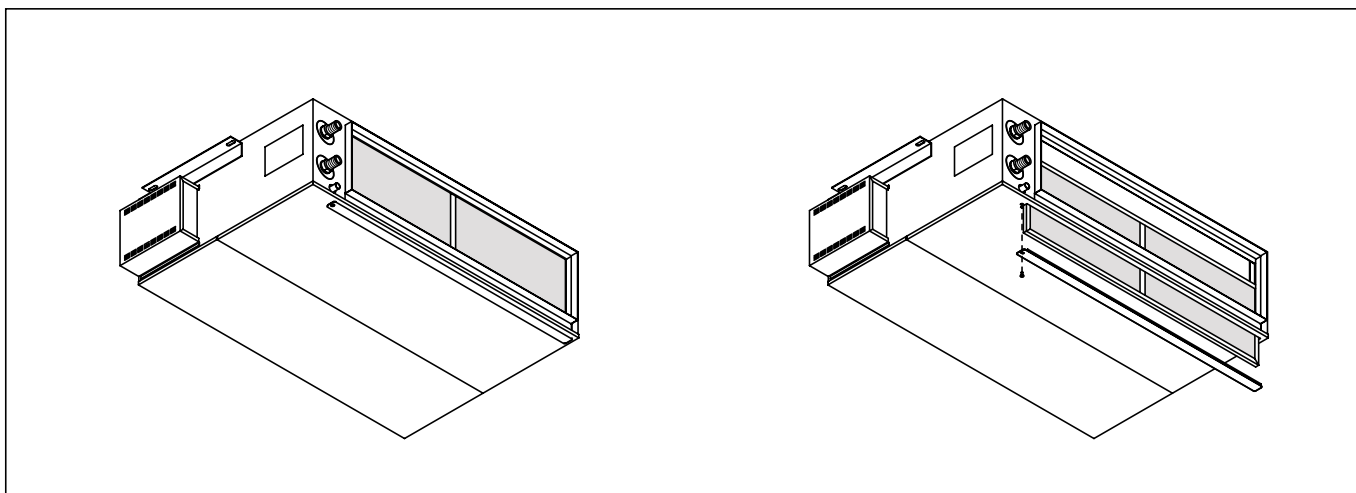
1. Checking the state of the air filters;
2. Checking the coil;
3. Checking the structural condition of the unit.

## CHECKING THE STATE OF AIR FILTERS

Depending on the environment where the internal unit is installed, the air filters need cleaning periodically. In particularly dusty atmospheres, the air filters should be cleaned every three months and you are recommended to have a differential pressure switch installed to indicate when the filters are dirty. This should be done by qualified personnel only.

## REMOVING AND CLEANING THE FILTERS

1. Remove the fixing screw, then the door.
2. Remove the air filter gently from the bottom, avoiding dispersion of dust in the atmosphere.
3. Wash the filtering layer with warm water and ordinary detergent, rinse and dry thoroughly.
4. Replace the filter
5. Replace the door and fix with the screw.



### CHECKING THE COIL

1. Remove any scale and dirt from the coil.
2. Check that the aluminium fins are not bent. If necessary, straighten them using a special tool to restore correct air flow through the coil. This should be done by qualified personnel only.

### CONTROL CONDITIONS STRUCTURAL OF THE MACHINE

1. Check the state of the unit as a whole.
2. Check for the formation of rust. If necessary, treat the parts affected with rust inhibiting paint.

3. Check the fixing of the external panels.
4. Check that fixing elements are not causing excessive noise and/or vibrations.
5. Check that condensate is draining correctly and that the pan is free from scale.
6. Check that the power supply cable is in good condition without cracks or lacerations. This should be done by qualified personnel only.



## SEASONAL MAINTENANCE

These operations should be carried out by qualified personnel only.

1. Check correct operation of accessories.
2. If the electric heater module is present, check electrical absorptions and operation of safety devices.
3. If the purifier module is fitted, check the condition of the filtering section and clean if necessary. Check the

operation of the safety devices.

4. If the humidifier module is present, turn off the power supply. Empty the water pan by means of the cock provided. Check the state of the electric heater. Remove any scale present and check operation of safety devices.



## USEFUL INFORMATION

For information on technical assistance and obtaining spare parts, see the **DE' LONGHI INTERNET SITE** at [www.delonghi.com](http://www.delonghi.com)

- **TOLL FREE** **800 019 190**
- **DE' LONGHI spa SWITCHBOARD 04224131**
- **INTERNET** **[www.delonghi.com](http://www.delonghi.com)**

